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ARKANSAS
ACADEMY OF SCIENCE

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Volume XVI

1962 ✓

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ARKANSAS ACADEMY OF SCIENCE

Forty-sixth Annual Meeting
Harding College
April 13-14, 1962

OFFICERS

President	-----	Truman McEver
President-elect	-----	Robert W. Shideler
Secretary	-----	R. Reece Corey
Treasurer	-----	E. E. Dale

SECRETARY'S REPORT

The first business meeting was called to order by President Truman McEver at 10:45 A.M., April 13, 1962, with 45 members in attendance. Dr. G. L. Ganus, Vice-President of Harding College, welcomed the academy and its affiliated groups to the campus.

The Secretary's Report, read by Dr. Corey, was accepted as read. The Treasurer's Report was read and submitted to the Auditing Committee by Dr. Dale. Dr. Noyce, as Editor-in-Chief, reported that the Proceeding had been delayed due to printing difficulties, but that they would be ready the following week. Dr. Noyce requested that he not be renominated as Editor-in-Chief. His resignation was accepted by President McEver, with regret.

The Historian, Dr. Dwight Moore, reported that a history of the academy was being compiled. He gave the following brief summary of the founding of the academy. "The Arkansas Academy of Science was organized in 1917 at the Medical Center in Little Rock. All of the members were from the Medical Center except Mr. Troy Lewis, who was elected as permanent secretary. Subsequently, the academy became inactive. In the fall of 1932, Dr. Moore met with Mr. Lewis and the Board of the Academy (by proxy); a meeting was planned for the spring of 1933 in Little Rock and a slate of officers was elected. The meeting in the spring of 1934 was hosted at State Teachers College in Conway and was the first meeting held on a campus. All subsequent meetings have been held on campuses of the colleges and universities in the state.

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The Secretary reported that AAAS research grants of \$50.00 each were awarded to:

Mac McClain	Larry Beene
Leah Williams High School	Jacksonville High School
Piggott, Arkansas	Jacksonville, Arkansas

President McEver appointed several ad hoc committees.

Nominations: J. R. Mundie, Chairman
Arthur Fry
O. L. Hughes

Auditing: W. R. Rushton, Chairman
James H. Fribourgh

Meeting Place: Albert M. Raymond, Chair-
man
I. A. Wills
Howard Moore

Resolutions: D. A. Slack, Chairman
Charles Smith
Glen Clayton

Following a spirited discussion on ways to improve the academy sessions, the meeting adjourned at 11:40 A.M.

The second business meeting was called to order by President McEver at 9:00 A.M., April 14, with 26 members present.

The Nominating Committee presented the following slate for officers:

Treasurer	E. E. Dale
Secretary	R. R. Corey
President-elect	Dwight Moore

The Treasurer and Secretary were continued in office, and Dr. Moore was elected President-elect by acclamation.

The Nominating Committee moved that Dr. Shideler be confirmed as President. The motion carried unanimously.

The Auditing Committee reported that the treasurer's accounts were audited and accepted.

The Resolutions Committee presented the following resolutions:

"Be it resolved that the Arkansas Academy of Science extend a vote of thanks to the Administration of Harding College for the use of its facilities and its gracious welcome, and to the local committee for its fine job of making arrangements for the meeting."

"Be it resolved that the Arkansas Academy of

Arkansas Academy of Science Proceedings

Science extend a vote of thanks to the officers of the past year for their fine service."

The resolutions passed unanimously.

The Meeting Place Committee reported that the academy had been invited to hold the spring 1963 meeting at Hendrix College, Conway. The gracious invitation of Hendrix was accepted.

President McEver presented the consensus of the Executive Committee concerning the question of the academy meeting with the Science Fair. 1. That both the academy and the Science Fair would benefit by continued association. 2. That the space problem could be alleviated by having separate banquets, one for the senior and collegiate academies and another for the science fair participants and parents. The awards program to be presented later that evening at an awards assembly. 3. The Science Talent Search papers to be presented Friday afternoon with the awards to be given at the awards assembly. 4. Suggested schedule for the senior academy be: first business meeting at noon on Friday, second business meeting at noon on Saturday, section meetings and papers to be Saturday morning and afternoon.

Dr. Lawson moved that the academy set aside a sum of money to present an outstanding science teachers award. The motion passed with the details of the award to be settled by the executive committee.

With no further business the meeting was adjourned at 9:55 A.M.

Respectfully submitted,

R. Reece Corey
Secretary

PROGRAM

Friday, April 13

- 9:30 a.m. to
2:30 p.m. Registration, American Studies Building.
- 10:45 a.m. Business Meeting, Auditorium in American Studies Building.
- 12:00 Noon Luncheon.
- 1:15 p.m. Science Education Section, Bible Building.
- 2:30 p.m. to
4:30 p.m. Section Meetings.
- 6:00 p.m. Banquet, College Cafeteria.
- 7:00 p.m. Science Fair Awards, College Cafeteria.
- 8:00 p.m. Address, Large Auditorium of Administration Building. "Research Problems and Fitness for the Space Age," R. T. Clark, Vice-President of Oklahoma City University and Director of the Cooperative Program with M.I.T.
- 7:00 p.m. to
10:00 p.m. Science Fair Exhibits, Rhodes Field House.
- 9:00 p.m. Science Films, Bible Building.

Saturday, April 14

- 8:45 a.m. Business Meeting, Small Auditorium of Administration Building. Treasurer's report and reports of standing committees and special committees. Election of officers. Location of next year's meeting. New business. Installation of officers.
- 10:00 a.m. General Session with the Junior and Collegiate Academies, Large Auditorium of Administration Building. Papers by Science Talent Search Winners. L. J. Paulissen, Director of State Science Talent Search, in charge.

SECTIONAL PROGRAM

Biology and Agriculture

Chairman: D. A. Slack

University of Arkansas

- SOME EFFECTS OF IONIZING RADIATION ON THE ORAL SUCKERS OF RANA PIPIENS EMBRYO. Charles C. Reed, Little Rock University.
- STUDIES ON THE LIFE HISTORY OF THE SOYBEAN-CYST NEMATODE, HETERODERA GLYCINES. D. A. Slack, University of Arkansas.
- A REVIEW OF SOME RARE ARKANSAS PLANTS — ENDEMIC AND DISJUNCT. Dwight M. Moore, Arkansas Polytechnic College.
- A LIST OF THE SMUT FUNGI OF ARKANSAS. G. E. Templeton, University of Arkansas.
- STUDIES ON THE LIFE HISTORY OF THE RICE LEAF SMUT ORGANISM, ENTYLOMA ORYZAE. A. Worawisitthumrong and G. E. Templeton, University of Arkansas.
- A NEW VARIETY OF LAMIUM AMPLEXICAULE. Dwight M. Moore, Arkansas Polytechnic College.
- A PRELIMINARY SURVEY OF LITTLE RED RIVER. W. R. Rushton, Harding College.

Chemistry

Chairman: W. D. Williams

Harding College

Division A.

- X-RAY DIFFRACTION STUDIES OF AQUEOUS SOLUTIONS. Richard Lawrence and Robert F. Kruh, University of Arkansas.
- CRITICAL TEMPERATURES AND DENSITIES OF THE $\text{SO}_3\text{H}_2\text{O}$ SYSTEM. John E. Stuckey and C. H. Secoy, Hendrix College.
- A FAR INFRARED STUDY OF THE SPECTRA OF SEVERAL COBALT - NITROGEN COORDINATION COMPLEXES. Allan B. Kittila and George D. Blyholder, University of Arkansas.
- THE PRECIPITATION OF ALUMINUM 8-HYDROXYQUINOLATE FROM MIXED SOLVENTS. Jerry L. Jones and Lester C. Howick, University of Arkansas.

THE NITROGEN ISOTOPE EFFECTS IN THE CURTIUS REARRANGEMENT OF BENZAZIDE. Joe C. Wright, University of Arkansas.

Division B.

THE KINETICS OF THE ACID CATALYZED OXYGEN-18 EXCHANGE BETWEEN p-SUBSTITUTED BENZOPHENONES AND WATER. B. C. Menon, University of Arkansas.

KINETICS OF BROMINATION OF ACETYL BROMIDE. Charles Reed, Little Rock University, and Daniel M. Mathews, Graduate Institute of Technology, University of Arkansas.

STEREOCHEMISTRY AND KINETICS OF THE HYDROGENATION OF 4-METHYL CYCLOHEXANONE. Bryan Sparks and Samuel Siegel, University of Arkansas.

THE ACID-CATALYZED REARRANGEMENTS OF SOME ALIPHATIC KETONES. Ikuo Ookuni and Arthur Fry, University of Arkansas.

AN OXYGEN-18 EXCHANGE STUDY OF THE MECHANISM OF THE REARRANGMENT OF BENZOPINACOL TO BENZOPINACOLONE. Bessie R. Sparks, Jane R. Sayler, and Arthur Fry, University of Arkansas.

Geology

Chairman: Norman F. Williams

Director Geological and Conservation Commission
State of Arkansas

SHEAR AND TENSION FRACTURE PATTERNS OF NORTHWEST ARKANSAS. John F. Gibbons, University of Arkansas.

TYPE LOCALITIES IN WASHINGTON COUNTY, ARKANSAS. Leo C. Carr, University of Arkansas.

GEOLOGICAL IMPLICATIONS OF SOIL MECHANICS. James H. Quinn, University of Arkansas.

PETROGRAPHY OF AN EXPLOSION BRECCIA NEAR BENTON, ARKANSAS. Kern C. Jackson, University of Arkansas.

NICKEL OCCURRENCES IN SOAPSTONE DEPOSITS, SALINE COUNTY, ARKANSAS. Philip J. Sterling, Arkansas Geological and Conservation Commission.

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SOME OF THE MORE UNUSUAL GEOLOGICAL PHENOMENA IN THE EASTERN OUACHITAS — SOUTHEASTERN ARKANSAS VALLEY REGION. Charles G. Stone, Arkansas Geological and Conservation Commission.

History and Political Science

Chairman: Keith S. Peterson

University of Arkansas

THE POLITICAL PHILOSOPHY OF SUBHAS CHANDRA BOSE, BENGALI REVOLUTIONARY NATIONALIST, 1897-1945. Robert L. Bock, Southern State College.

NATIONAL TRENDS IN THE PUBLIC CARE OF DEPENDENT CHILDREN, 1900-1935. Foy Lisenby, Arkansas A & M College.

OBSERVATIONS ON SIMON BOLIVAR BY BAPTIS IRVINE, 1819. John C. Pine, University of Arkansas.

TOWARD A MORE REALISTIC EVALUATION OF THE UNITED NATIONS. Gene E. Rainey, Harding College.

Mathematics

Chairman: O. L. Hughes

Arkansas State Teachers College

TRANSITIVE CONTINUOUS FUNCTIONS FROM THE UNIT INTERVAL INTO ITSELF. Glen Haddock, Arkansas College.

Physics

Chairman: M. L. Lawson

Harding College

THE VAN DE GRAAFF ACCELERATOR. Everett H. Cathey, Jr., Veterans Hospital, Little Rock.

THE REGIONAL COUNSELOR PROGRAM IN PHYSICS. Paul C. Sharrah, University of Arkansas.

THE STRUCTURE OF LIQUID MERCURY. G. T. Clayton, University of Arkansas.

A SOAP BUBBLE DEMONSTRATION. Harmon Brown, Harding College.

THE DESIGN AND OPERATION OF MECHANICAL CALCULATORS. Victor Higgins, Remington Rand Corporation.

Science Education

Chairman: Lowell F. Bailey

University of Arkansas

REPORT ON THE ACADEMY-SPONSORED VISITING SCIENTISTS PROGRAM. John Keesee, University of Arkansas.

THE SUMMER INSTITUTE FOR HIGH SCHOOL STUDENTS AT SOUTHERN STATE COLLEGE. John J. Chapman, Southern State College.

A NEW NATION-WIDE COUNSELING PROGRAM IN PHYSICS. Paul Sharrah, University of Arkansas.

THE ADVANCED PLACEMENT COURSE IN BIOLOGY AT CENTRAL HIGH SCHOOL. Maude Reid, Little Rock.

THE NATIONAL SCIENCE FOUNDATION UNDERGRADUATE RESEARCH PARTICIPATION PROGRAM IN CHEMISTRY AT THE UNIVERSITY OF ARKANSAS. Arthur Fry, University of Arkansas.

A NEW COURSE IN RADIOISOTOPE TECHNIQUES AT ARKANSAS STATE COLLEGE. Howard Moore, Arkansas State College.

PROGRESS REPORT ON THE ACADEMY-SPONSORED HIGH SCHOOL CURRICULUM STUDY. Lowell Bailey, University of Arkansas.

SOME EFFECTS OF IONIZING RADIATION ON THE ORAL SUCKERS OF *RANA PIPIENS* EMBRYOSCharles C. Reed
Little Rock University

INTRODUCTION

Gastrulation is perhaps the most critical stage in the development of the embryo.¹ During this stage, cells, in addition to normal cell division, are undergoing differentiation to independent and interdependent structures. During this period of differentiation the embryo is in the period of maximum susceptibility to environmental changes. Any adverse environmental changes occurring during gastrulation should produce the maximum effect on the embryo.

It has often been shown that epithelial cells possess a high degree of sensitivity, especially those that are active secretors.² The question immediately arises as to the sensitivity of the epithelial cells exposed to adverse environmental conditions prior to the time of their differentiation. If the embryos were subjected to exposure to gamma radiation during gastrulation, the columnar epithelial cells of the oral suckers would be exposed to the ionizing radiation prior to the time the neural plate is formed. Since the oral suckers arise from the neural plate, the cells of the oral suckers would have been exposed to gamma radiation prior to their differentiation.

The purpose of this investigation is to study the various effects of ionizing radiation, specifically gamma radiation, on the yet undifferentiated oral suckers of the *Rana pipiens* embryo in respect to effects on total body size, size of oral sucker, and position of oral sucker.³

MATERIALS AND METHODS

Adult *Rana pipiens* were obtained and were kept in hibernation at approximately 4°C. until needed in the investigation. Eggs were obtained by Rugh's ovulation method via anterior pituitary injection and artificial fertilization.⁴

The zygotes were then placed in finger bowls in 5 cm of pond water. There was a maximum of thirty eggs per finger

¹Rugh, Roberts, *The Frog Reproduction and Development*, p. 101.

²Rugh, Roberts, "Histological Effects on the Embryo Following X-irradiation" *Journal of Morphology*, Vol. 85 (1949), pp 483-501.

³The author would like to express his gratitude to Dr. James H. Fribourgh, Little Rock University, for his suggestions and guidance throughout this investigation.

⁴Rugh, Roberts, *Experimental Embryology*, pp 102-106.

bowl. The finger bowls were kept in an air-bath and by means of an oil-mercury thermo-regulator the temperature of the water in the finger bowls was maintained at $18^{\circ}\text{C} + .08\text{C}$.

The embryos were subjected to single exposures of gamma radiation at stages 8, 9, or 10. Shumway stages were employed.⁵ The gamma radiation was obtained from a Keleket-Barnes Telcobalt Unit employing 1,000 curies of Cobalt 60 as the radiation source.⁶ Internal filtration prevented all radiations from reaching the target area with the exception of two gamma rays. One gamma ray had an energy of 1.17 MEV and the other had an energy of 1.33 MEV. The Telcobalt Unit had recently been calibrated with a Victoreen Roentgen Meter employing the ionization method of calibration. The total error in dosage calculation inclusive in the experiment was ± 3 percent. The dose rate was 2,000 roentgens per ten minutes and fifty-six seconds at a distance of 35 cm from the cobalt source. The embryos were irradiated 35 cm from the source in regular size finger bowls in 5 cm of water. The eggs were floating less than 1 cm below the surface of the water. The water depth was included in the dosage calculation. One group of embryos was subjected to a single exposure of 6,000r, the second group to 12,000r and the third group to 20,000r.

The embryos were killed and fixed in Bouin's Fluid at stages 18 and 19. Those embryos which had accomplished hatching were then dehydrated, cleared, infiltrated and sectioned at 10 microns. The sectioned embryos were stained in Delafield's haematoxylin and eosin counter stain. The slides were studied microscopically.

Drawings were made of the embryo and the particular regions under study with the aid of a camera lucida. The areas of the embryo and of the structures under consideration were measured with a planimeter.

On the camera lucida drawings, lines were constructed in order to measure the area of the embryos, the area of the oral suckers, and various degrees of the oral suckers. One line was drawn in the area of the notochord paralleling the structure. A second line was drawn perpendicular to the first line and through the mid point of the area of the pharynx. The line through the pharynx was the base line for measurements of various angles of the oral suckers. Using a compass, the angles were measured from the base line anteriorly.

⁵Ibid., pp 56-72.

⁶This unit was made available through the courtesy of Dr. Howard Barnhard of the Radiology Department, University of Arkansas Medical School.

Radiation of Rana Pipiens Embryo

One measurement was made from the base line to the anterior edge of the oral suckers and another was made to the posterior edge of the oral suckers. From these two lines the total number of degrees of arc covered by the oral suckers could be measured as well as the maximum degree reached anteriorly and posteriorly and the mid-bearing or the mid-compass degree of the area of the oral suckers. These drawings and measurements were made of the irradiated embryos as well as the non-irradiated embryos.

RESULTS

An analysis of the experimental data reveals that the total area of the oral suckers decreased with increasing radiation exposure. The total area of the embryos decreased with increasing exposure to gamma radiation.

The position of the oral suckers moved anteriorly with increasing exposure to radiation as is indicated by the increasing degree of the mid-bearing. The total arc of the oral suckers in degrees covered was unaffected significantly by the radiation.

Table 1. Average relative planimeter measurement of *Rana pipiens* embryo, the oral suckers, the degrees of arc of the oral suckers, mid-bearing of the areas of the oral suckers, the maximum anterior and posterior degree of the oral suckers when exposed to 6,000r, 12,000r, and 20,000r of gamma radiation.

	Non-Irradiated	6,000r	12,000r	20,000r
Total area of embryo	6630	3068	3113	2146
Maximum anterior bearing of oral suckers	37.5°	65°	87°	109°
Maximum posterior bearing of oral suckers	9.8°	35°	57°	73°
Mid bearing of oral suckers	24°	51°	72°	92°
Degrees of arc of oral suckers	27.7°	30°	30°	36°
Area of oral suckers	117	60	62	42

The epithelial cells of the oral suckers lacked uniformity. The position and size of the nuclei were irregular as was the general shape of the cells.

One difficulty encountered is perhaps worthy of note. In obtaining *Rana pipiens* eggs it was found that seven female anterior pituitaries were required instead of the five suggested by Rugh for the season, September-January. (See Rugh, *Experimental Embryology*.)

CONCLUSIONS

One effect noted was that of the decrease in total area of the embryo with a corresponding increase in radiation dosage. This, in part, can be explained by Rugh's observations of the histological effects of ionizing radiation.⁷ Rugh found that "mitosis was abruptly inhibited in all cells which had not started the process. Those cells which were in mitosis at the time of irradiation were either able to complete the process or the nuclei and chromatin were so severely damaged that the typical intermitotic "resting cell" stage could not be achieved."

Since the actual process by which mitosis is inhibited by radiation is not known it might be assumed that this is not an all-or-none process and that increasing dosages of radiation affect increasing numbers of cells. This would tend to support the Quantum Hit Theory, which states that the effect of ionization is due to absorption of quanta by a small sensitive volume in the cell, generally thought to be the chromosome or gene. Increasing dosages of radiation would make more quanta available for absorption thus increasing the effects or the extent of the effects. Also with increased radiation exposure more cells would be affected. Since the radiation was conducted on all the embryos at the same time, reduction in body size would be the expected results with increasing dosages of radiation if the assumptions listed above are correct. Another possibility is that of reduction in amount of interstitial material or reduction in the size of the cells or a combination of all three.

The actual measurements were not germane to this paper, hence no attempt was made to scale the drawings nor to convert the planimeter readings in Table 1 to the metric system. All drawings and measurements were made under the same conditions, consequently all data are relative.

The second observation was that the total area of the oral suckers decreased as the radiation increased. In this epithelial tissue, effects were noted that were similar to those observed by Rugh in the gut epithelium of irradiated Salamanders, for example, lack of uniformity of the position and size of the nuclei, irregular shaped cells which were seriously disarranged.⁸ The oral sucker epithelium in the irradiated groups seemed to be fewer in number than of the oral suckers of the non-irradiated embryos. However, this is not claimed as a radiation effect at this time.

⁷Rugh, Roberts, "Histological Effects on the Embryo Following X-irradiation," *Journal of Morphology*, Vol. 85 (1949), pp. 483-501.

⁸*Ibid.*, pp. 483-501.

Radiation of Rana Pipiens Embryo

The third effect was that of the displacement of the oral suckers. With increased exposure to gamma radiation the location of the oral suckers was displaced anteriorly. The increased radiation exposure did not affect the number of degrees of arc occupied by the oral suckers, but only affected the displacement of the mid-bearing.

Since the oral suckers arise from the neural plate which extends laterally as far as the lateral neural folds and joins the anterior edge of the transverse neural folds perhaps the reason for the anterior movement was that the process of neurulation was indirectly affected through interference with the normal process of gastrulation. Radiation was carried out during gastrulation and just prior to neural plate formation. It is thought that neurulation is completely dependent upon gastrulation as far as normality is concerned.⁹ If this is the case, any damage to the process of gastrulation produced by radiation would necessarily affect the process of neurulation, and might well be the answer for the anterior displacement in that the transverse neural fold occurred more posteriorly than normal thus causing the neural plate to arise more posteriorly than normal and the oral suckers more anteriorly.

The effects observed in the irradiated embryos must, at this time, be attributed *en toto* to the gamma radiation. However, the effect of the ionization of the water by the gamma rays must not be overlooked. The resulting products, for example, OH radicals, solvated electrons, protons, hydrogen atoms, molecular hydrogen and hydrogen peroxide, can not be ignored. The scope of this study does not include investigation in this area; however, it should be pointed out that Rugh observed that the effects noted in his investigations were not affected by the irradiated water.¹⁰ Titus C. Evans concluded that the chief, if not the only, factor in the water affecting the embryos was hydrogen peroxide and the effects were definite at doses of 100,000r and questionable or ineffectual under 50,000r.¹¹

It may be noted that the methods of arriving at the above conclusions did not take into consideration the half-lives of the various ionization products. The half-lives are extremely vari-

⁹Rollanson, G. S., "X-irradiation of Eggs of *Rana Pipiens* at Various Maturation Stages", *Biological Bulletin*, Vol. 95 (1949), pp. 169-178.

¹⁰Rugh, Roberts, "Inhibition of Growth and the Production of Oedema by X-irradiation", *Journal of Experimental Zoology*, Vol. 144 (1950) pp. 137-147.

¹¹Evans, Titus C., "Effects of Hydrogen Peroxide in the Medium by Radiation on Spermatozoa of *Arbacia Punctulata*", *Biological Bulletin*, Vol. 93, p. 108.

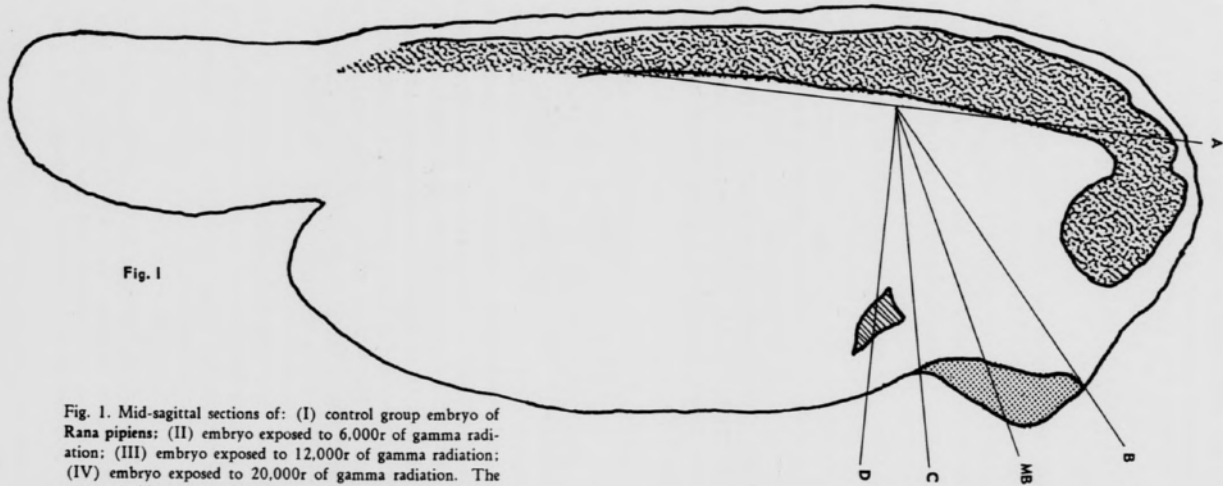


Fig. 1

Fig. 1. Mid-sagittal sections of: (I) control group embryo of *Rana pipiens*; (II) embryo exposed to 6,000r of gamma radiation; (III) embryo exposed to 12,000r of gamma radiation; (IV) embryo exposed to 20,000r of gamma radiation. The camera lucida drawings show: (A) line constructed through the area of the notochord, (D) the base line through the area of the pharynx, (B) the line through the anterior extremity of the oral sucker, (MB) the mid-bearing line, and (C) the line through the posterior extremity of the oral sucker. The primitive brain is also shown.

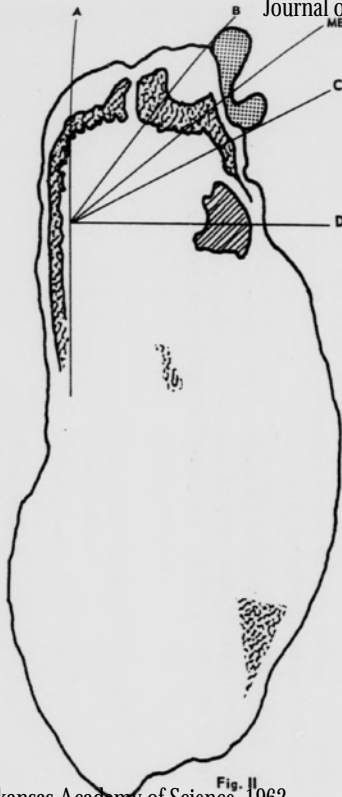


Fig. II

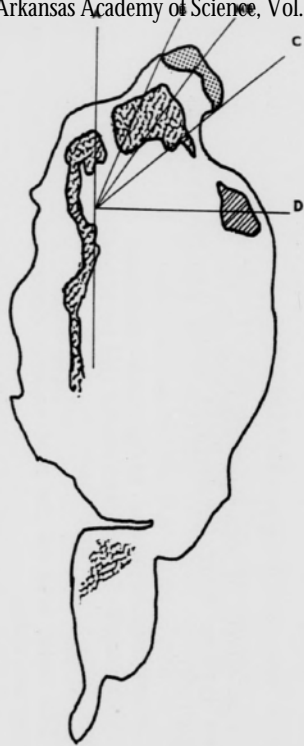


Fig. III

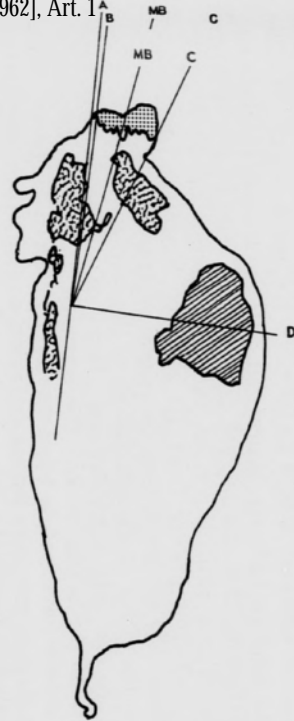


Fig. IV

able, but it is thought that the range is from 10^{-5} seconds to several minutes or hours. Investigation by Dr. Art Solomon of the BioPhysical Lab of the Harvard Medical School established that the "half-time for diffusion exchange of tritiated water into human erythrocytes was $4.2 \times 10^{-3} \pm 1.1$ milliseconds."¹² This would tend to indicate, unless red cells are unique in their rate of diffusion, that the rate of diffusion in cells of the embryos might permit infiltration of those ionization products which have half-lives greater than 10 seconds. Since, at the time of exposure, the embryos were composed of from 59 to 96 percent water, the effect of the ionization of the media would not necessarily be the only consideration. Some of the products of ionization of the water within the embryos are extremely reactive and would have ample opportunity to react with parts of the protoplasmic structure before diffusion out of the embryos could take place.¹³ Certainly extensive investigation in this area is indicated.

SUMMARY

1. The effects of ionizing radiation on the oral suckers of the *Rana pipiens* were investigated using gamma radiation from Cobalt 60.
2. Increasing exposure to gamma radiation from 6,000r to 20,000r resulted in a decrease in the total body area of the embryos.
3. The total area of the oral suckers decreased as radiation exposure increased.
4. Similar histological effects were produced in the columnar epithelium of the undifferentiated oral suckers by exposure to gamma radiation as were observed in gut epithelium of X-ray exposed salamanders.
5. Increasing exposure to gamma radiation increased the anterior displacement of the area of the oral suckers. The total degrees of arc of the oral suckers was unaffected by radiation up to 20,000r.

¹²This was established in personal communication with Dr. Solomon.

¹³The author would like to thank Dr. Daniel M. Mathews, University of Arkansas Graduate Institute of Technology, whose advice was invaluable in this investigation.

A LIST OF THE SMUT FUNGI OF ARKANSAS

G. E. Templeton
University of Arkansas

This list of smuts in Arkansas is a compilation of the smuts collected in Arkansas and deposited in the Mycological Herbarium of the Department of Plant Pathology at the University of Arkansas and those listed from Arkansas in *Manual of the North American Smut Fungi* by Fischer (1). Those smut species or hosts which are not presently in the herbarium, but which are reported by Fischer as occurring in Arkansas, are marked with an asterisk (*).

There are 30 species of smut listed representing 9 genera and parasitizing 27 species of host plants. Undoubtedly this list can be expanded substantially.

One species of smut, *Tilletia youngii* Clint. and Zundel, has been collected only in Arkansas. This species was collected by Dr. V. H. Young, former head of the department of Plant Pathology, University of Arkansas, and was named for him by Clinton and Zundel in the *North American Flora* in 1939. (2). This smut occurs in the ovaries and internodes of *Alopecurus carolinianus*, one of the small, inconspicuous foxtails. The original collection was made at Marianna, Arkansas, and no recent collection has been made.

SMUT FUNGI REPORTED IN ARKANSAS

SMUT	HOST
1. * <i>Cintractia axicola</i> (Berk.) Cornu	<i>Fimbristylis</i> sp.
2. <i>Doassansia sagittariae</i> (Westend.) Fischer	<i>Sagittaria montevidensis</i> Cham. and Schlecht.
3. * <i>Entyloma australe</i> Speg.	<i>Physalis longifolia</i> Nutt.
4. <i>Entyloma compositarium</i> Farl.	<i>Ambrosia trifida</i> L.
5. <i>Entyloma oryzae</i> Syd.	<i>Oryza sativa</i> L.
6. <i>Melanopsichium pennsylvanicum</i> Hirschh.	<i>Polygonum lapathifolium</i> L.
7. * <i>Sorosporium cenchri</i> Henn.	<i>Cenchrus</i> sp.
8. <i>Sorosporium ellisii</i> Wint.	<i>Andropogon virginicus</i> L.
9. <i>Sorosporium everhartii</i> Ell. and Gall.	<i>Andropogon virginicus</i> L.
10. <i>Sphacelotheca reiliana</i> (Kuhn) Clint.	<i>Sorghum vulgare</i> Pers.
11. <i>Sphacelotheca cruenta</i> (Kuhn) Potter	<i>Sorghum halepense</i> (L.) Pers. * <i>Sorghum sudanense</i> (Piper) Stapf.

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|---|---|
| 12. * <i>Sphacelotheca sorghi</i> (Link) Clint. | <i>Sorghum halepense</i> (L.) Pers
<i>Sorghum sudanense</i> (Piper) Stapf. |
| 13. <i>Tilletia barclayana</i> (Bref.) Sacc. and Syd. | <i>Oryza sativa</i> L. |
| 14. <i>Tilletia caries</i> (DC.) Tul. | <i>Triticum vulgare</i> Vill |
| 15. <i>Tilletia foetida</i> (Wallr.) Liro | <i>Triticum vulgare</i> Vill. |
| 16. <i>Tilletia youngii</i> Clint and Zundel | <i>Alopecurus carolinianus</i> Walt. |
| 17. <i>Urocystis agropyri</i> (Preuss) Schrot. | <i>Elymus canadensis</i> L. |
| 18. <i>Urocystis kmetiana</i> Magn. | <i>Viola kitaibeliana</i> R. and S.
var. <i>rafinesquii</i> (Greene) Fern. |
| 19. <i>Ustilago avenae</i> (Pers.) Rostr. | <i>Avena sativa</i> L.
<i>Hordeum vulgare</i> L. |
| 20. * <i>Ustilago bullata</i> Berk. | <i>Bromus catharticus</i> Vahl.
* <i>Bromus polyanthus</i> Scribn. |
| 21. * <i>Ustilago crusgalli</i> Tr. and Earle | <i>Echinochloa crusgalli</i> (L.) Beauv. |
| 22. <i>Ustilago cynodontis</i> (Pass.) | <i>Cynodon dactylon</i> (L.) Pers. |
| 23. <i>Ustilago heterogena</i> Henn. | <i>Panicum virgatum</i> L. |
| 24. <i>Ustilago hordei</i> (Pers.) Lagerh. | <i>Avena sativa</i> L.
<i>Hordeum vulgare</i> L. |
| 25. <i>Ustilago maydis</i> (DC.) Cda | <i>Zea mays</i> L. |
| 26. <i>Ustilago nuda</i> (Jens.) Rostr. | <i>Triticum vulgare</i> Vill. |
| 27. <i>Ustilago ornata</i> Tr. and Earle | <i>Leptochloa</i> sp. |
| 28. <i>Ustilago sphaerogena</i> Burr. | <i>Echinochloa crusgalli</i> (L.) Beauv. |
| 29. <i>Ustilago striiformis</i> (Westend.) Niessl. | <i>Poa pratensis</i> L. |
| 30. <i>Ustilago syntherismae</i> (Schw.) Peck | <i>Digitaria sanguinalis</i> (L.) Scop. |

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SHEAR AND TENSION FRACTURE PATTERNS OF NORTHWEST ARKANSAS

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The study of fracture patterns can yield information concerning both regional and local structural features developed in the crust of the earth. Such a study requires that relatively standardized field techniques be applied to certain geologic settings in order to be most effective. First, fracture patterns must be studied on a regional basis to determine the vertical and areal configuration of the regional fracture pattern. Second, such a study is most advantageously carried out in an area of reasonably gentle deformation containing a relatively simple regional fracture pattern. An area which has undergone intense deformation and/or metamorphism would tend to have a too complex and incompletely preserved fracture pattern which would make detailed fracture pattern analysis virtually impossible. Third, detailed studies of all types of local structural features present must be carried out in order to determine if there are unique fracture patterns associated with these structures and what relationship these fracture patterns bear to the regional fracture pattern.

Northwest Arkansas is an ideal area for a fracture pattern study. As a result of field work carried out in the summer of 1961 in northwest Arkansas and subsequent analysis of the data gathered, the regional fracture pattern of this area has been established, and the existence of unique fracture patterns of smaller order in northwest Arkansas has been recorded.

Regional Shear Fracture Patterns of Northwest Arkansas

The regional shear fracture pattern of northwest Arkansas is made up of five component sets. These sets have the following average strikes and stratigraphic extent: Set 1a strikes N 55° E and is present from the Pre-Cambrian into Permian age rocks; Set 1b strikes N 30° W and is present from the Pre-Cambrian into the Permian rocks; Set 2 strikes N 5° W and is present from the Pre-Cambrian into the Atoka Formation (Pennsylvanian); Set 3a strikes N 70° W and is present from the Pre-Cambrian through the Boone (lower Mississippian); Set 3b strikes N 7° E and is present in the rocks from the Pre-Cambrian through the Boone (lower Mississippian). A numerical designation was assigned to each set for convenience, and each set will be hereafter referred to by these numbers.

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Sets 3a and 3b are the oldest shear fracture sets in northwest Arkansas. These sets are roughly contemporaneous and are interpreted to be immediately post-Boone in age. Application of the strain ellipsoid to these sets of shear fractures indicates a compressional force operative in a northwest-southeast direction. This force corresponds in direction to the force necessary to produce the northeast trending set of folds mapped in northwest Arkansas (4). Inasmuch as these folds are expressed in rocks of Morrowan Age they must be as young as the Morrowan (4). The difference in age of the shear fractures and the folds may be explained by the hypothesis that shear fractures are produced by the initial impulse of the applied compressional force which ultimately produced northeast trending folds of Morrowan Age.

Sets 1a, 1b and 2 were generated during Pennsylvanian and Permian time. These sets have been attributed to compressional forces associated with the Ouachita orogeny (3). Sets 1a and 1b fulfill the conditions of the strain ellipsoid and would indicate a north-south compressive force. Set 2 fulfills the qualifications for shearing parallel to the direction of a compressional force acting in a north-south direction (2). Sets 1a, 1b, and 2 correspond generally in age to the time of formation of the east-west trending folds of northwest Arkansas (1, 5).

The shear fractures of the regional patterns may be recognized in several ways. Shear fracture planes are generally straight or very smoothly curved. These shear fractures cut through local differences of composition, tenacity, and density, in the rock without appreciable deflection. Shear fractures are generally tightly closed unless they have been opened by secondary solution or by secondary movement. Shear fractures are never observed to be offset at their intersection with bedding planes or other planes of weakness in the rock.

Fracture Patterns Associated With Folds and Faults

Tension fractures which are unrelated to the regional fracture pattern of northwest Arkansas are frequently associated with local structures. These tension fracture patterns have the gross configuration of belts of fracturing encompassing the trend of the associated structures. Maximum concentration of fracturing occurs in the vicinity of maximum deformation with fracturing becoming less dense with distance perpendicular to the area of maximum deformation. Density of fracturing and width of the fracture belt are mutually dependent upon the magnitude of the structure and on the brittleness of the rock in which the fracture pattern is expressed. Tension fractures may be recog-

Shear and Tension Fracture Patterns

nized by their rough and angular fracture planes, which are considerably more open than those of shear fractures, and by the presence of offsetting of the fracture planes at their intersection with other planes of weakness in the rock.

Tensional Fracture Patterns Associated with Faults

Two sets of tension fractures comprise the fracture pattern associated with faults. The best developed and most dense set of tension fractures are generally developed parallel to the strike of the fault. A less dense, less well-developed set of tension fractures is usually developed perpendicular to the strike of the fault. Thus a roughly rectangular fracture pattern is expressed with the long axis of the rectangle parallel to the trend of the fault.

The tension fractures are interpreted to be the result of the tensional stress field responsible for gravity faulting. Displacement identical to that of the fault has occurred along these tension fractures at some localities. This relationship indicates the possibility of a genetic relationship between the tension fractures and the larger faults.

Fractures Associated with Collapse Structures

A detailed study of a collapse structure located in the city of Fayetteville near Lake Lucille was carried out in the fall of 1961. A very dense tension fracture pattern was observed along the limbs of this structure. Along steeply dipping portions of the limbs near the axis of the structure the fracture pattern was chaotic. Farther away from the axis of the structure the fracturing is more systematic resembling the rectangular fracture pattern associated with faults. This structure, which resembles a normal tectonically produced syncline, is thought (Quinn, J. H., 1961, Personal Communication) to be the result of collapse due to solution of soluble rocks at depth. The tension fractures are the result of tensional forces produced by the lengthening of rock necessary to produce a synclinal configuration from originally flat-lying rocks.

Tension Fractures Associated with Folding

A concentration of tension fractures was observed parallel to the strike of the fold along the axial region of anticlines and monoclines. These fracture patterns consist primarily of a set of fractures parallel to the strike of the fold with an extremely poorly developed set perpendicular to the strike of the fold.

Conclusions

Until the close of Boone time the rocks of northwest Arkansas were not systematically fractured. Immediately following

Boone time a compressional force was exerted on the rocks acting in an essentially northwest-southeast direction and Sets 3a and 3b were generated. From this time until at least Atoka time the rocks that were deposited were not systematically fractured. Between the beginning of Atoka time and Permian time compressive stresses were again active and Set 2 was generated. Sets 1a and 1b were generated after Set 2 and are at least as young as Permian. Thus, two general periods when compressive forces were active are indicated by the presence of shear fractures. That these times were the only times of diastrophic activity cannot be determined since it is not known whether rocks being deformed under conditions of deep burial are subject to shear fracturing. That such rocks are subject to shear fracturing at the maximum depth of burial encountered in northwest Arkansas is indicated by the fact that the shear fracture sets penetrate the entire stratigraphic column. These two periods of shear-fracturing correspond roughly to the two recognized periods of folding in northwest Arkansas. The first appearance of these fracture patterns, especially in the case of Sets 3a and 3b, precede the youngest expression of the associated set of folds and may be explained by the hypothesis that fracturing occurs as a result of the initial impulse of force responsible for folding.

The tensional fracture patterns associated with local structures are interpreted to be contemporaneous with the formation of the structures. Thus, it is possible to assign a relative age to these local structures by observing the cross-cutting relationships of the tension fractures and the regional shear fractures of known age. Furthermore, the trend of faulting is invariably parallel to the long dimension of the rectangular fracture patterns associated with faulting.

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GEOLOGICAL IMPLICATIONS OF SOIL MECHANICS

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The processes involved in soil development are essentially destructive. They are engendered by contact of the atmosphere with rocks formed in a vastly different environment, and express themselves in the disintegration and/or decomposition of certain rock components. The end products of the destructive process are quartz sand, soluble components and clay minerals. The quartz grains tend to remain behind along the interface of air-rock contact. The salts are removed by infiltrating water under warm-humid climatic conditions, and the clay particles tend to be washed downward and abandoned in smaller interstitial cavities. At the same time organisms ranging from bacteria to nematodes and larger animals carry on their activities below the air-earth interface. Plants rooted below and extending upward into the atmosphere contribute likewise to the system.

Interaction of the components of the soil-forming process results in the gradual separation and rearrangement of atmospheric and earth materials producing recognizably differentiated zones or units designated by letter terminology as A, B and C horizons. Biological, chemical, physical and geological considerations are involved in the complexities of the interactions. Much of the process is less than clearly understood. Long known but generally neglected factors, especially those involving atmospheric mechanics, may furnish additional understanding of soil development and at the same time may contribute to an explanation of some puzzling geological problems.

The process of rock destruction, in Earth Science terminology, is weathering. Disintegration, or mechanical destruction, is said to be predominant under arid or sub-arid conditions (insufficient precipitation to promote extensive solution and illuviation). Decomposition or chemical destruction is considered to be prevalent under humid conditions. Involved is hydrolization and solution of certain components resulting in unit disintegration. For example: ground feldspar in distilled water is subject to leaching and contributes a sufficient number of potassium, sodium or calcium ions, whichever may be present in the feldspar, to produce an alkaline litmus reaction in less than one hour, depending on how finely the rock is ground. Under natural conditions where the active ions have been removed, the remaining portion is "clay (Kaolin)" which has

little strength. If the parent material is a granular igneous rock, destruction of the feldspar by decomposition permits disintegration of the remainder. Under humid conditions the leaching process may continue as long as soluble material remains. Under arid or perhaps cold conditions the process may not be carried beyond the initial stages of decomposition.

Moisture and temperature conditions appear to be major factors in determining soil 'types.' It is assumed also that regardless of parent rock composition the end products of weathering are quartz sand and silt, clay and soluble salts. Thus a mature soil developed under warm, humid conditions includes similar A, B and C horizons more or less clearly defined, regardless of parent rock type. The thickness of the horizons is presumably dependent on time as well as climatic conditions. Productivity of a soil may depend more or less on organic activity and content. Nutrient materials in the soil which are available to plants is a measure of fertility, which also is generally assumed to be a product of organic content and activity. Thus Jenny (1950, pp. 43-44) said, "It is often stated that it takes thousands of years to produce one inch of soil." At the same time he suggested the rate might be much higher with respect to "softer rocks, like certain sandstones and shales." Evidently Jenny equated the rate of soil development with the rate of weathering. This assumption is not compatible with the "fertility" profile of a natural soil which lies in the "top soil" or 'A' horizon. Stripping the A horizon under improper farming practices leads to marked reduction in fertility. It appears entirely reasonable, therefore, that fertility is "built" into the soil by organic activity and the accumulation of organic material. Rankama and Sahama (1955, pp. 333-4) suggested that plants tend to accumulate minerals which become concentrated in the topmost layers of forest soils. Likewise (*ibid.*, p. 342) they pointed out the role of bacteria in the process of rock decomposition, which amounts to increasing the quantity of inorganic material dissolved from rocks and their minerals during weathering.

Provided the only source for soil enrichment is carbon dioxide and nitrogen from the air, processed by plants and combined with earth materials made available through organic activity, fertility must finally depend on a positive balance between accumulation in the A horizon and loss through leaching and the physical removal of plant material.

Regardless of other factors, long-term loss is inevitable. Some plant material must blow away or be carried away by animals. Progressively large amounts, depending on humidity and precipitation, are lost by leaching. The Mississippi River

Geological Implications of Soil Mechanics

(Fig. 1) annually removes from an area covering 1,265,000 square miles, 136,400,000 tons of dissolved material and 340,500,000 tons in suspension (Emmons, Thiel, Stauffer and Allison 1955, p. 172). The grand total, removed mainly from the surface or near surface A horizon, amounts to almost 477 million tons or 377 tons per square mile per year. Of this quantity about 108 tons is dissolved material. Destruction of forests and prairies in the Mississippi basin may have accelerated erosion. Humphreys and Abbott (1876, p. 148) reported that the river empties 406 million tons of mud in the Gulf of Mexico yearly, a difference of 71 million tons, which may or may not represent a real increase in suspended load since the 1800s. In any event, the dissolved load might concomitantly decrease because solution is mostly attributable to water cycled through the soil to the groundwater body and the rate of infiltration decreases with removal of plant cover. Much of the dissolved material may be supplied from limestone and gypsum deposits (In the lower Mississippi River the sodium-calcium ratio is about 2 Na to 5 Ca) but some is derived directly from the soil, from decaying plant remains and from bacterial activity. The vast quantity of suspended and dissolved material which must be removed from the surface of the land by leaching and erosion is so impressive in magnitude it seems impossible for soil fertility to be increased by organic activity under temperate humid conditions (such as exists over much of the Mississippi drainage basin). Nevertheless, fertile virgin soils are a matter of record and it becomes necessary to find a natural means of supplying mineral resources to replace those lost by erosion and solution.

Two sources of replacement solids are the oceans and deserts of the world. Vast quantities of solids, mainly salts and some organic material, are blown into the air with spray during storms. The water involved falls back into the sea or evaporates in the air leaving the salts as dust particles. These may be carried by the winds and widely dispersed over the continents.

Salt particles serve as condensation nuclei and are washed out of the atmosphere as dissolved material in rain drops. At Perth, Australia, the salt fall out is $3.40 \text{ mg/cm}^2/\text{year}$ (Eardley et al., 1957, p. 1149). In Iowa it is 0.381 (Goldschmidt 1954, p. 592). In round figures this rate of input would equal about 10 tons per square mile, or a total of about 560,000 tons of salt for the state of Iowa.

If the figure for Iowa is taken as average for the entire Mississippi River drainage basin, covering about 1,243,000 square miles, the total salt fall-out would amount to as much as 12.5 million tons per year.

Besides NaCl, it may be supposed proportionate amounts of all the other substances found in sea water are present in fall-out material. These, without doubt, contribute to soil fertility. Under humid conditions most of the dissolved salts might be expected to be carried away by runoff without having been precipitated. In the desert where the evaporation rate is high, most salts would be deposited and the less readily soluble constituents would remain and contribute to soil enrichment.

In the Mississippi basin the rate of loss of salts is about 108 tons per square mile while the possible increment from the sea is no more than about 10 tons, far less than the needed quantity to counterbalance the loss.

The second source of solid material is the deserts of the world which supply dust. The particles are rock fragments and mineral grains which have escaped extensive leaching. Likewise, a minimum of organic material and activity is involved in the processes which reduced the particles to dust size. Little need be said concerning the potential fertility of desert soils or the fertility of loessal deposits which have been derived from desert areas. Measurements of the quantity of dust transferred yearly into the Mississippi drainage area are not available. Conjectures may be posed on the basis of loess deposits, production of dust storms of the 1890's reported by Udden (1896, p. 655), dust storms of the 1930's reported by Lugn (1935, pp. 165-166) and the immense quantity of material removed yearly by the Mississippi River. By analogy with the salt fall-out and fluvial performance, the amount of dust received yearly in the Mississippi basin must be vastly greater than the amount removed. According to Udden (1896, p. 662) 850,000,000 tons may be held in the atmosphere at one time and transported as far as 1500 miles. Otherwise the development of fertile soils in a land of active leaching should not be possible. Lugn (1935, p. 166) described a single dust storm of March 20, 1935, from which 5 grams of dust per square foot was collected in a pan of water situated on the roof of Morrill Hall. This would amount to 1,536 tons per square mile. Later that spring an additional 800 tons per square mile were added. This total of 2,336 tons per square mile compares very favorably with the average of 270 tons per square mile removed by the Mississippi River. It may not be supposed that the yearly increment can be based on a locally investigated dust storm, and in the absence of comprehensive measurements, it can only be conjectured that a uniform supply of dust is provided yearly from the desert regions of western United States, which amounts to an area equivalent in size to the Mississippi basin, and that this supply of relatively unleached earth material is of primary importance in the de-

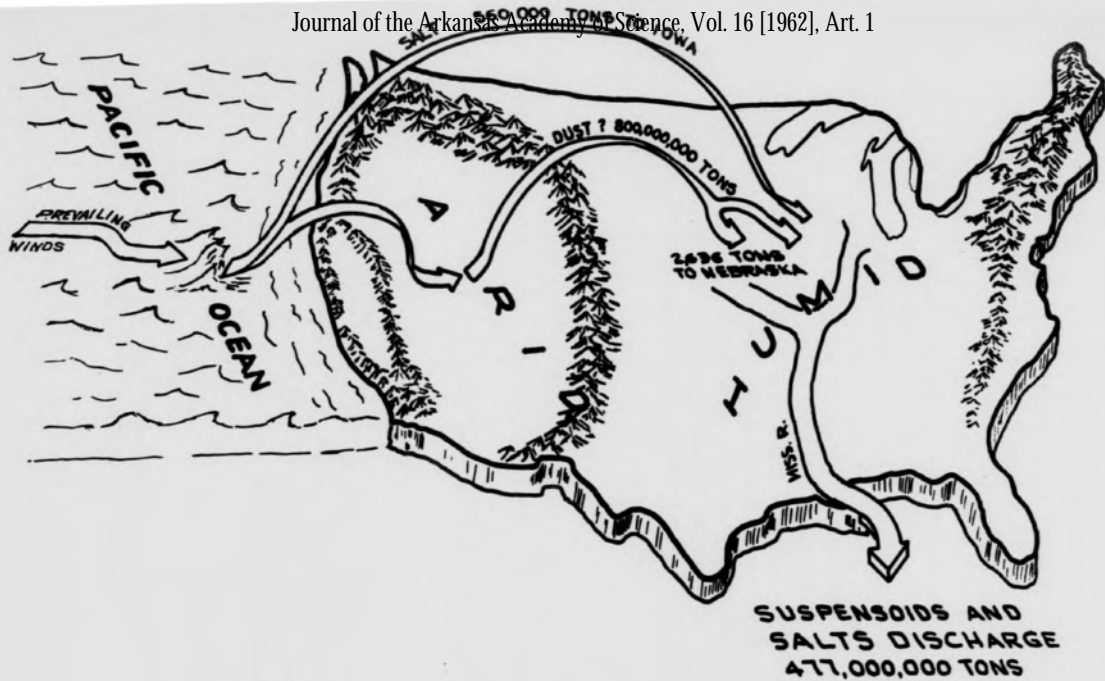


FIG. I
SALT AND SILT SUPPLIED TO THE MISSISSIPPI BASIN
BY THE ATMOSPHERE AND THE AMOUNT CARRIED
AWAY BY THE MISSISSIPPI RIVER

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velopment of fertile soils. Thus it may be that the great dust storms of the 1930's were not an unqualified disaster but actually contributed materially to the burgeoning productivity of midwestern soils.

It may be further conjectured that increased precipitation over western deserts with concomitant increase in plant cover would tend to reduce or terminate (for all practical purposes) the supply of dust to midwestern soils. Without the new solids furnished by the wind, leaching would progressively reduce the fertility of the soils in the midwestern area. At the same time the process of soil development would contribute to the segregation of an A horizon composed of maturely weathered quartz sand. Finally, fertility would be reduced beyond the point necessary to the maintenance of continuous plant cover. Without protection, erosional processes would remove the sterile sand layer to the B horizon, where presumably a new cycle might begin in a new soil profile formed or forming on potentially more fertile material. In this way an unlimited supply of quartz sand might be provided to a depositional site under continuously humid conditions.

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THE POLITICAL PHILOSOPHY OF
SUBHAS CHANDRA BOSE, BENGALI
REVOLUTIONARY NATIONALIST, 1897-1945

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. . . He (Subhas Bose) gave to India her first *Azad Hind Raj*, a "Free Indian State," and with it her great national salutation *Jai Hind* "Glory to India," side by side with Bankim Chandra's gift *Vande Mataram* "I Salute Thee Mother." For all that he has achieved, his name and fame will be a beacon light for all Indians, irrespective of caste, creed or colour; and he will be a pattern and exemplar for all lovers of their country and people, who want to see them free. To have known such a man is a great honour; and to have come in touch with him, even in a perfunctory manner, is certainly a great good fortune . . . I have sought to give a record of . . . one, who, for the spirituality of his outlook, the depth of his love for his motherland and the greatness of his achievement, can without travesty be hailed as a **Patriot Saint of India** . . . Suniti Kumar Chatterji.

Subhas Chandra Bose, (1897-1945), as Bengali Revolutionary Nationalist, is a sort of Jekyll-Hyde yet Roosevelt-Hitler type of mutant in modern Indian political history. The only All-India Congress Party rival and ideologist who ever seriously challenged Mahandas Gandhi's leadership, Bose's political philosophy was sprinkled with fascist and communist ideas as well as being based upon Indian and British political thought. Subhas Bose, of more pragmatic bent than the Mahatma, more nearly resembled the activism of C. R. Das, the Patels, Lajpat Rai, Tilak, and Motilal Nehru, who followed a relatively forceful policy. Allegedly, Bose would, on the edge of violence, advise the use of force—even the bomb and revolver—as reprisals, although the lack of weapons in itself made Gandhi's non-violent technique ultimately obvious even to Bose and the question of armed terror irrelevant. Gandhi, therefore, had no problem with either Congress strongman, Sardar Patel, or Congress Socialist, Pandit Nehru, once his charismatic leadership of the masses had been established and his method proved successful, such as the sensational Salt March to the sea.

Bose, on the other hand, had rejected Gandhi as his guide after returning from Cambridge in 1921. Deshabandhu C. R. Das, Congress leader of Bengal, appealed to Bose's pragmatic sense and became his political guru, or teacher. They were very close—Bose was Calcutta Mayor Das's chief executive officer, and they served political prison sentences together. The untimely death of Das in 1925 caused Bose to assume domination of Congress in Bengal, once the rural faction of J. M. Sen Gupta was brought into line. Editing the party newspaper, serving as labor and youth leader, as Bengal and National Congress officer, Bose performed admirably as an executive. The Volunteers he commanded, uniformed, and drilled before the 1928 Calcutta National Congress session, were a portent of the future Netaji's I. N. A. Whether to be called an example of Karl Wittfogel's "oriental despotism," Hitler's "fuhrer prinze," (Netaja means leader), or Lenin and Stalin's "dictatorship of the proletariat," the second but high caste Kshatriya Bose was "acting out" his warrior caste tradition, and in the following years was to become an eclectic authoritarian.

Norman D. Palmer in *The Indian Political System* (1961) refers to Paul Appleby's appraisal of modern Indian political leadership as being "extraordinary" with reference to such leaders as Gandhi, Nehru, Vallabhbhai Patel, and before them Tagore, Gokhale, and Tilak. Palmer considers the latter along with Gandhi, Bose, Vinoba Bhave (Gandhi's disciple), Chakravarti Rajagopalachari, and Nehru to be truly "charismatic," to use Max Weber's term for the near-demigod in mass politics. Since Indians place great emphasis on the good effects resulting from personal contact with a "great man," called *darshan*, the concept of the hero in history is especially important there. It is ironic that both Carlyle and Nietzsche gave vent to such themes in Europe about the time of that second great rush for overseas colonies in the African chapter of colonialism in late nineteenth century. However, from Joseph Conrad to Hannah Arendt, keen observers of that mad race for raw materials, have shown the brutalization that primitive conditions effectuated upon effete examples of Western Culture—like Kurtz and Carl Peters, causing a more calloused capitalistic leadership than ever before—such as Leopold decimating the Congo tribesmen or Wilhelm boasting of the new Huns (his Germans) in putting down the Boxers. Likewise, in twentieth century India, both before and after independence, illiterate masses, fragmented politically in village life, must have "democracy" imposed upon them from above. Nehru, nevertheless, has not abused his powers.

Subhas Bose saw the need for the greatest possible national unity in the new free India to withstand the decentraliza-

tion tendencies of linguistic and historical differences engendering bitterness, hate, and suspicion between regions, not to mention casteism and communalism. Both Selig S. Harrison's *India: The Most Dangerous Decades* (1960) and Amaury de Rien-court's *The Soul of India* (1960) point out such Balkanization problems facing India in the 1960's and the latter also refers to "the most baffling set of social and economic problems likely to present themselves anywhere in the world." They fear a dictator, such as Ayub Kahn of Pakistan or Soekarno of Indonesia, may soon be indicated for India to hold the nation together against these divisive forces. Harrison is especially concerned with the linguistic nationalisms that have already divided Bombay state and threaten to create a separate Sikhdom state out of Punjab. Because of the unpopularity of Hindi in the non-Hindi speaking areas, Harrison not only fears the decline of English as lingua franca but also looks somewhat wistfully at Subhas Bose's 1938 Congress Presidential Address at Haripura in which he called for the use of the Roman script for the Hindustani basic language employed in the British Indian Army to be considered for the unifying of all India itself.

Norman Palmer cites such diverse pessimists about liberal democracy's future in India as Jayprakash Narayan, C. Rajagopalachari, India's only Governor-General during the interim before Republic Day in 1950 and now leader of the Swatantra right-wing, anti-socialist political party, and Suniti Kumar Chatterji. The latter, professor of Calcutta University, in his "Personal Reminiscences" for the Netaji commemoration volume edited by S. R. Sharma, (Agra, 1951), relates:

Subhas is no more, he is now gathered to the Hall of Heroes . . . he turned lifeless and brainless automata into living and thinking men. The personnel of the Indian Army, magnificent fighters, but unthinking pawns in the Englishman's game of imperialism, were made by him to feel for the first time in a hundred and fifty years that they too were men, and had their duty to their people and country — their destiny was not to remain for ever the slaves of the British Sarkar . . .

Chatterji also praised Bose's proving Hindu-Muslim communalism "is an artificial creation, an incubus" of the British colonial divide and rule policy, pitting people alike in blood, language, culture, history, life and mind against each other because of the "outer paraphernalia of formal religion." He credits Bose with making "the Hindu and the Muslim, the

Sikh and the Christian, and the native Indian and the Anglo-Indian, feel as brothers, as one Indian people, single and indivisible." This great achievement—brought to light at the post-war trial of the I. N. A. officers (one Sikh, one Muslim, and one Hindu) for war crimes and treason, brought such reaction in the form of naval mutinies, police strikes, and riots in the major cities that the British transfer of power was surely hastened.

Chatterji's valedictory is certainly one of darshan. It is certainly overdone, but is sincere. New York Times reporter A. M. Rosenthal has described the alternative to the method of "totalitarian democracy," whether it is called guided, partyless, or equalitarian (Bose's term) as "the attempt of the Government to match the awakening desires of an enormous population and to convince itself and the people that they should resist the attractions of what seem to be the swifter methods of authoritarianism." Norman Palmer, himself a pessimist about Nehru's liberalism surviving him, cites the great successor to Gandhi as believing the peaceful Indian revolution was truly revolutionary and one of the most significant in world history, but was far from complete in the social and economic sphere.

This latter phase must necessarily mean transforming a caste-ridden society into a truly secular national state, where religion is not mixed up in politics. As Dr. Ambedkar, India's best known "untouchable," has said, during the draft constitutional debates: "The religious conceptions in this country are so vast that they cover every aspect of life from birth to death." Norman Palmer has concluded, in fact, that there is no such thing as Indian political theory *per se*, separate from Hindu religious concepts. In fact, Palmer cites Professor J. P. Suda as concluding that a truly secular state would not be anti-religious or irreligious, but merely neutral in religious matters; yet, the danger in this idea would be the loss of the peculiar Indian genius for spiritual greatness, which Arthur Koestler fails to find relevant today in his provocative recent book, *The Lotus and the Robot*, (1960), debunking the mysteries of the East as offering no answer to the ills of "Western materialism."

Nevertheless, religion was strongly used to free India politically, and may be difficult to eradicate from the social revolution. Subhas Bose, himself, differed with Nehru on the question of communism in the 1930's over the religious matter, with Bose siding closer to Indian tradition. Tilak, the Maharashtra activist, revived the cult of Shivaji, the great seventeenth century Maratha warrior-hero in the 1890's. The Gan-

apati festivals were used for political purposes. He also reinterpreted the *Bhagavad Gita* so as to preach a philosophy of political and religious action. This was similar to the interpretation of Ramakrishna's divinings by the Bengali, Swami Vivekananda. The latter proposed the "Sannyasi Statesman" as the noblest ideal, and his teaching captivated the young Subhas Bose's mind. Then, after World War I, the Gandhian campaigns of satyagraha (soul force) and ahimsa (nonviolence) as well as his theories of "only good means to achieve ends" gained hold. The Bengali remained more activist in the Tilak tradition, however, and Bose himself made public obeisance to the Goddess Kali, the symbolic representation of *Shakti*, primal power. During post-World War I, India was ripe for Gandhi's new method of non-violence, non-cooperation, mass protest, boycott, and strike. The relatively small terrorist movement in Bengal and Punjab, plus such conspirators with the Germans as Har Dayal's Ghdar (Mutiny) Conspiracy in California and Mahendra Pratap's Turco-German Mission in Europe, led the British to suppress rather than reward the thousands of Indians who had fought and died for their masters in many lands.

By the time World War II threatened liquidation of the British Empire, Subhas Bose nearly symbolized all that had gone wrong between India and Great Britain. Despite an overall enlightened record of British colonialism in India—medicines and sanitation information saved lives, but ironically, increased famine victims; railroads crisscrossed India to bring grain to sufferers and accelerate population growth but could also carry repressive troops—racial discrimination was certainly the ultimate source of the social antagonism which led to the naval mutinies at the time of the I. N. A. trials. Although the British authority, Phillip Mason, contends the Labor Government was ready to quit India anyway, British Intelligence Officer Hugh Teye's first-hand biography of Bose, *The Springing Tiger*, convincingly shows that Netaji's glorification by Nehru and Congress leaders at the Red Fort trial was a calculated and successful campaign. The sensationalism of Sunday supplement stories in the Indian press that Bose was still alive was confirmed by Sardar Bose. Brother Subhas was allegedly prepared to lead a People's Army out of Communist China. Sardar's landslide victory and other Leftist successes at the polls in post-Republic Bengali politics, especially in Bengal, helped perpetuate the myth for years. Two AIFB lower house members won in 1962 in Calcutta. It further remains a tragedy that the two all-Indian leaders, Gandhi and Bose, who both so steadfastly opposed partitioning Pakistan, were not permitted opportunity to personally attempt a unified approach. But mar-

Political Philosophy of Subhas Chandra Bose

tyrdom in each case—Bose for independence, Gandhi for communal understanding—left their legends more lasting.

Bose had two political philosophies: Marxist and **Forward Blocist**. The former he derived from his Red Flag trade union and youth group contacts, from visits with Benes, Laski, Romain Rolland, his longtime friendship with Nehru, and finally, in death, the objective use by the Communists of his personal popularity as revolutionary myth. His concert with the Axis in his career's finale, and his association, literally, with Mussolini, Hitler, and Tojo, fix his star as a symbol of totalitarian dictatorship and enemy of Western democracy. Indians honor him, however, for his unmitigated harassment of the British Raj—more as the Tom Paine than the Benedict Arnold, as some British hold, of the Indian Revolution.

However, Bose's ashes still lie in an urn in a temple in Japan, and have been officially so established. (Tom Paine, incidentally, still remains an atheistic American Founding Father never yet commemorated on a postage stamp.) The similarity is that both share some tarnish, or in Bose's case, taint. His argument with Nehru in **A Bunch of Old Letters** that Jewish refugees should not be accepted from Germany because it would give a certificate of good conduct to the real enemy, Great Britain, was callous. Some reports of Bose after the futile efforts of his "malaria units" at Imphal are discrediting, namely Hugh Teye's, although Major General Shah Nawaz Khan, Deputy Communications Minister in New Delhi, rescues his military reputation in his published memoirs.

Selig Harrison refers to Bose as the "most categorical" and "unabashed" candidate for "dictatorship in India's political heritage" in his **The Most Dangerous Decades**. Harris Wofford, recently an assistant to the President of the United States, now in charge of the U. S. Peace Corps program for Africa, has in 1960 written in a personal letter:

. . . For me Subhas represents the X factor in the politics of India—the immeasurable, incoherent, largely irrational force of superstition and frustration and anger and violence which lurks under the surface in every country. . . Nehru has outfoxed these forces in India, at least for the time being and has been on balance a successful calming factor, however ineffective he seems to me to be in dealing with many of India's most pressing problems . . . In 1957, I was struck by how much progress, at least on the surface, the process of westernization . . . has made. Yet we see only the top of the iceberg. What is below the surface is beyond us, but I fear that what I here called the X factor is not at all dead there.

As a quasi-totalitarian ideologue, Bose typically invoked the name of justice and history. In *The Indian Struggle*, 1935-1942 Bose stated:

. . . But Forward Bloc will have no truck with Imperialism. Socially, Gandhism is intimately linked up with the "haves"—the vested interests. As the "have-nots" are becoming class conscious . . . the breach . . . is widening . . . With regard to the future, Gandhian ideas of post-struggle reconstruction which are partly medieval and partly anti-socialist are contrary to those of the Forward Bloc, which has a thoroughly modern outlook and stands for socialistic reconstruction.

Perhaps the historical conflict between Gandhi and Bose represents the paradigmatic conflict — the Jefferson-Hamilton myth — in the developing story of modern India.

NATIONAL TRENDS IN THE PUBLIC CARE OF DEPENDENT CHILDREN, 1900—1935

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In the period 1900-1935, American attitudes toward child dependency underwent considerable revisions, and by the 1930's most of the nation's child welfare leaders had adopted new approaches to the problem. During the same period new views on dependency in general were emerging. In the nineteenth century, a prevailing view of poverty linked it to laziness or immorality, and those who gave to the poor often regarded their beneficiaries as the "lower class." Public charity, which was provided primarily by the counties, seldom furnished adequate relief, but a bare minimum of care. In the twentieth century, more positive approaches have been widely adopted. Condescending charity gave way to the new principle of social service, designed to prevent poverty in addition to applying palliative measures.¹

Although the older views connecting dependency with sin and laziness seldom applied to children, there was often a tendency to regard children as miniature adults. The presence of child paupers in almshouses and of juvenile delinquents in jails illustrates a failure to recognize the special needs of children. The separation of children from adult dependents, delinquents, and defectives was an important goal of certain child welfare movements originating in the nineteenth century and gaining momentum in the twentieth.

Reaction against placing children in almshouses, along with a wide variety of defective, diseased, and immoral adult paupers, was demonstrated by the increase in private orphanages and by the practice of state boards of charities of removing the children from the almshouses and finding other methods of care for them.

The first juvenile court opened in Chicago in 1899. During the next two decades, other states provided for juvenile court systems, some of them statewide, others established only in the larger cities. The juvenile court movement was based on the principle that juvenile delinquents should not be treated as adult criminals. The courts were given jurisdiction over dependent as well as delinquent children. Definitions of de-

¹Amos Griswold Warner, Stuart Alfred Queen, and Ernest Bouldin Harper, *American Charities and Social Work* (New York: Thomas Crowell Company, 1930), pp. 25, 34; President's Research Committee on Social Trends, *Recent Social Trends in the United States* (New York: McGraw-Hill Book Company, 1933), p. 1,238.

pendency differed from state to state, but most of the juvenile court laws described as dependent, and perhaps neglected, any child who was below a certain age and destitute, homeless, abandoned, without proper guardianship, in association with disreputable persons, begging, or in an environment dangerous to morals or health. In many states, the courts acquired broad jurisdiction not only over children but also over adults contributing to the dependency, delinquency, or neglect of children.²

By 1920, most state legislatures had enacted progressive juvenile court laws, but the local governments were often very slow in making the laws effective. The rural sections were especially lagging in the development of juvenile court work. Few rural communities were capable of providing the special detention quarters which the United States Children's Bureau regarded as essential to an effective juvenile court system.³

In addition to the principle of separate, special treatment for youthful dependents and delinquents, another significant concept in child care gained wide acceptance in the twentieth century—the importance of home life for every child. In 1906, the Children's Committee of the National Conference of Charities and Correction called for a greater emphasis on the value of home life in the care of dependent children.⁴ Both public and private care for dependent children had been based largely on transferring children from unwholesome environments to institutions such as orphan asylums. Poverty alone, rather than cruelty or neglect by parents, frequently was the reason for commitment to orphanages. In the first decade of the twentieth century, many social welfare leaders accepted the principle that no child should be removed from his home because of poverty alone. This idea received great impetus from the first White House Conference on the care of dependent children, a meeting called by President Theodore Roosevelt in 1909. The Conference stressed the importance of a mother's care and declared that needy mothers should be assisted in keeping their children

²National Conference of Charities and Correction, *Proceedings*, 1899, p. 54; Herbert H. Lou, *Juvenile Courts in the United States* (Chapel Hill: University of North Carolina Press, 1927), pp. 15, 32, 54, 68.

³John A. Fairlie and Charles M. Kneier, *County Government and Administration* (New York: The Century Company, 1930), p. 26; George B. Mangold, *Problems of Child Welfare* (New York: The Macmillan Company, 1936), p. 389.

⁴Hastings H. Hart, "Report of Committee on Children," in National Conference of Charities and Correction, *Proceedings*, 1906, p. 88.

Trends in Public Care of Dependent Children

with them at home. The Conference recognized the fact that homeless children, and those whose parents were cruel or neglectful, would have to be given a substitute for normal home life. Foster-home care was endorsed as the best substitute for home life in such cases, and institutional care labeled as the last resort. When institutional care was necessary, the institution should try to approximate family life as closely as possible.⁵

The most significant result of the new emphasis on home life was a movement for providing public pensions for mothers with dependent children. The first mothers' pensions (or mothers' aid) laws were enacted in Missouri and Illinois in 1911. In the next two years, sixteen other states followed their example. By 1934, forty-six states had passed mothers' aid laws.⁶ The laws varied considerably from state to state. In some states, the juvenile court was made the administrative agency; in others, administration was assigned to regular poor relief boards or to some local board created especially for the new program.⁷ Most of the mothers' aid laws were permissive; they authorized, but did not compel, local governments to grant allowances to mothers with dependent children. The counties, especially in the rural districts, were slow to inaugurate the new relief program. The addition of state funds to supplement local financing in some states stimulated the counties to participate to a greater extent. A few states (from 1917 to 1935) revised their laws to make mothers' aid mandatory for all counties. Despite the inertia of the counties, the number of children benefiting from mothers' aid increased from 121,000 to 250,000 in the period 1922-1931.⁸ Most of the financial support came from local governments, but after 1931 several states began to assume some of the financial responsibility.

At first the mothers' aid laws were designed primarily to assist widows with dependent children, but by 1919 a movement was underway to liberalize the laws by extending eligibility to other needy mothers. By 1934, thirty-six states au-

⁵George B. Mangold, *Organization for Social Welfare* (New York: The Macmillan Company, 1934), p. 76; Hazel Frederickson, *The Child and His Welfare* (San Francisco: W. H. Freeman and Company, 1948), p. 21; Arthur E. Fink, Everett E. Wilson, and Merrill B. Conover, *The Field of Social Work* (New York: Henry Holt and Company, 1955) p. 48.

⁶Mangold, *op. cit.*, p. 77; United States Children's Bureau, *Standards of Child Welfare* (Washington: Government Printing Office, 1919) p. 440; President's Research Committee on Social Trends, *op. cit.*, p. 1,243.

⁷Mangold, *op. cit.*, p. 78.

⁸United States Children's Bureau, *Twentieth Annual Report* (Washington: Government Printing Office, 1932), pp. 15-16; President's Research Committee on Social Trends, *op. cit.*, p. 770.

thorized aid for mothers whose husbands had deserted, and twenty-one states permitted aid to divorced mothers. The trend toward more liberal terms of eligibility continued, and a number of states added unmarried mothers to the list. Although the states thus broadened the scope of their mothers' aid programs, the death of the father continued to be the primary reason for dependency.⁹

For homeless children, and for those who were neglected and mistreated, foster-home care became accepted as the best substitute for the home. During the nineteenth century children were placed out by numerous child welfare agencies and institutions and by county poor relief officers. Placing out gained in favor to the extent that in the 1890's there was a marked decline in institutional care for dependent children. Child placement often took place without effective investigation and supervision of the foster homes. To prevent exploitation of children who were placed out, a number of states enacted laws providing for considerable regulation of child-placing activities. In the twentieth century, both public and private welfare agencies made progress in correcting many of the deficiencies which often had characterized foster-home care.¹⁰

While new views in child care were gaining acceptance, the states increased their activities in behalf of dependent children. Until the last third of the nineteenth century, the states had been very inactive in child welfare, except for providing institutional care for defective children. Relief for paupers, both adults and children, had come from private charitable agencies and from county and city poor relief officials. One of the first methods by which state governments began to aid dependent children was subsidizing private children's institutions and agencies. Under this plan, orphanages and child-placing societies received appropriations for the partial support of their wards. A few states actually owned institutions for dependent children, but on the whole subsidization was preferred because it was easier and cheaper and afforded an indirect way of pro-

⁹United States Children's Bureau, *Mother's Aid, 1931* (Washington: Government Printing Office, 1933), p. 3; United States Social Security Board, *Social Security in America* (Washington: Government Printing Office, 1937), p. 234; President's Research Committee on Social Trends, *op. cit.*, p. 771.

¹⁰Homer Folks, *The Care of Destitute, Neglected, and Delinquent Children* (New York: The Macmillan Company, 1902), pp. 82, 182, 187; United States Department of Commerce, Bureau of the Census, *Benevolent Institutions, 1910* (Washington: Government Printing Office, 1913), p. 65.

viding for unfortunate children. The subsidy system received many criticisms from social workers who maintained the funds spent to support private institutions could be used more effectively in state-directed child-placing programs.¹¹ However, the policy of granting subsidies generally was retained.

From 1863 to 1935 many states increased their welfare activities by establishing boards of charities and corrections, whose duties included supervising state-controlled and state-subsidized institutions and visiting and inspecting local jails and poorhouses.¹² State boards were given additional powers and eventually most of the boards acquired responsibilities in the care of dependent children. Typical activities of a state board in behalf of dependent children were supervising and licensing private children's institutions, as well as public and semi-public institutions for children; conducting "placing-out" programs; and making studies of dependency, neglect, and other conditions among the children of the state. Some states developed programs in which the central board would act as the co-ordinator of state-wide child welfare programs. The state officials would work with local public welfare officers, juvenile court judges, and probation officers, public and private eleemosynary institutions, and child-placing agencies. Centralization of authority was generally avoided; there was a tendency to temper growing state responsibility with local control of administration.¹³

In the period 1900-1935 social welfare leaders became increasingly aware of child dependency among Negroes, whose economic status remained inadequate in both North and South. The lag was evident in both public and private care for dependent children. Dependency among Negro families remained most pressing in the South, where there were six states

¹¹Mary Stevenson Callcott, *Principles of Social Legislation* (New York: The Macmillan Company, 1932), p. 71; John Lewis Gillin, *Poverty and Dependency: Their Relief and Prevention* (New York: The Century Company, 1922), pp. 189-190, 205.

¹²Sophonisba P. Breckinridge, "Summary of the Present State Systems for the Organization and Administration of Public Welfare," in *American Academy of Political and Social Science, Annals*, CV (1923), pp. 94-95; F. H. Gavisk, "State Supervision," in *National Conference of Charities and Correction, Proceedings*, 1911, p. 10.

¹³President's Research Committee on Social Trends, *op. cit.*, pp. 770, 1,240; Sophonisba P. Breckinridge, *Public Welfare Administration in the United States: Select Documents* (Chicago: University of Chicago Press, 1938) p. 13; Howard W. Odum, *American Social Problems: An Introduction to the Study of People and Their Dilemmas* (New York: Henry Holt and Company, 1939), pp. 425-426.

containing 71 per cent of the nation's Negro population.¹⁴ In the South, the alleviation of child dependency was generally neglected.

During the depression years of the 1930's, both private and public welfare agencies, being deprived of a large portion of their resources, were not only incapable of providing for the additional child dependency caused by the depression, but were forced to reduce their services and economic assistance. Local and state governments appropriated less money for such programs as mothers' aid, and progress in case work for neglected children was curtailed. Many public welfare leaders were convinced that the resources of the federal government were needed to combat dependency.¹⁵ The Social Security Act of 1935 contained provisions for federal assistance in the care of dependent children. The child welfare services section of the act provided federal assistance to the state welfare agencies in case work, primarily in rural areas. The "aid to dependent children" section made federal funds available, on a matching basis, to states which complied with certain regulations set by the Federal Social Security Board.¹⁶

In some respects, the new federal-state programs were a continuation of activities begun by the states in the preceding generation, but federal aid made the earlier programs seem small in comparison.

¹⁴White House Conference on Child Health and Protection, *Organization for the Care of Handicapped Children* (New York: The Century Company, 1932), p. 26; Howard W. Odum, *An Approach to Public Welfare and Social Work* (Chapel Hill: University of North Carolina Press, 1926), p. 52; White House Conference on Child Health and Protection, *Addresses and Abstracts of Committee Reports* (New York: The Century Company, 1931), p. 326.

¹⁵United States Social Security Board, *op. cit.*, p. 251; Arthur P. Miles, *An Introduction to Public Welfare* (Boston: D. C. Heath and Company, 1949) p. 205.

¹⁶U. S., *Statutes at Large*, XLIX, Part I, pp. 629, 633.

BAPTIS IRVINE'S OBSERVATIONS ON SIMON BOLIVAR, 1818-1819

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Throughout the Latin American Wars of Independence, 1810-1825, United States special agents were dispatched to patriot centers as observers. These agents were to report on the progress of the revolutions and were to protect the rights of American citizens. The agents sent voluminous reports back to the State Department describing outstanding political figures, revolutionary activities, and the progress of patriot governments. In 1818 Baptis Irvine was sent on such a special mission to Venezuela. Many of Irvine's negotiations were carried on personally with Simon Bolivar and the agent had ample opportunity to form an impression of the famed revolutionary hero.

Throughout Irvine's reports to the State Department are found numerous civil, military, and personal references to the Great Liberator. Irvine's impressions were important to the State Department because the special agent was the only American citizen or official to have an extensive personal contact and protracted correspondence with Bolivar.

Irvine's early reports viewed General Bolivar favorably. As time passed, Irvine was unable to satisfactorily adjust United States differences with Venezuela and the reports describing Bolivar became more critical. Irvine was disappointed to find an absence of republican or democratic institutions and soon became jaundiced about Venezuelan politics. The reports in which these observations are to be found are a mixture of fact, fancy, and prejudice. They, nevertheless, constitute one source from which the State Department determined its relations with the newly formed Venezuelan government.

Irvine was an ambitious Irish immigrant who had come to America as a fledgling journalist. He was possessed of considerable ability with a pen and was particularly adept at writing in a vindictive vein. After understudying editors in Philadelphia and Washington, Irvine was editor of Baltimore and New York papers. He was a famous if not infamous liberal and radical. He relished the spirit of controversy; journalistic

duels, litigations, and private quarrels characterized his life.¹ Rash and impetuous, but democratic and humanitarian, Baptis Irvine fought for and championed those ideals in which he believed.

The mission of Agent Irvine to the Venezuelan capital, Angostura, was looked upon with anticipation by Simon Bolivar. The General heartily welcomed Special Agent Irvine and dubbed him the "diputado" of the United States. Irvine commenced his first interview with the Liberator by stating that the object of his mission was to promote a good understanding between Venezuela and the United States.

General Bolivar avowed principles so liberal on every subject broached that one must coincide with him pretty generally. He is an affable, fluent man who appears well informed, theoretically at least, in the most important branches of the policy of states . . . Some say Bolivar is destitute of solid judgement, but he certainly has very good literary abilities, is quick in perception, brilliant and voluble in conversation, eloquent in writing, with the advantage of very agreeable conciliatory manners. . . .²

In 1817 two American merchant ships had been captured by the Venezuelan navy and the State Department wanted Irvine to obtain restitution of the vessels and their property. Irvine appealed to General Bolivar and a lengthy correspondence resulted. The Venezuelan government claimed its actions concerning the ships to be legal. After three months of what Irvine called "hackneyed" correspondence, Bolivar closed the negotiations by refusing to change his position. Irvin wrote,

Thus . . . General Bolivar magisterially terminated a discussion that was daily exposing him to ridicule—desperately clinging to a piratical act as legal capture. . . . Like Macbeth he deemed it so good . . . and on he marched in contempt of truth and justice.³

¹Clarence Brigham, "Bibliography of American Newspapers, 1690-1820," *Proceedings of the American Antiquarian Society*, XXVII, Part 2 (Oct. 17, 1917), 387.

²Baptis Irvine to John Quincy Adams, July 20, 1818, State Department, "Special Agents," MSS. National Archives, VIII.

³Irvine to Adams, Oct. 10, 1818, *ibid.*

Observations on Simon Bolivar

Harsh as this language was, Irvine remarked, it was literally true. He characterized Bolivar's actions:

He has already undergone more changes than a butterfly—successfully passing through the stages of compliment, complaint, petulance, puerility and reproach; sophistry, false assumptions, and unbounded assertions constituting his chief or only weapons.⁴

One subject in which Irvine took special interest was Bolivar's relationship to the civil authority in Venezuela. Prominent and impartial individuals had assured Irvine that no leader other than Bolivar could so effectually lead the people.⁵ Irvine was reticent to accept this evaluation. Bolivar was reputed, he wrote, to be jealous of rivalry in civil and military life. This Irvine believed indicated envy or inferiority or both. Although General Bolivar might have been the one individual capable of maintaining unity among the discordant patriots, he could only accomplish it through a dictatorship. This, to Irvine, was blasphemy against democracy and republicanism. It was the opinion of other citizens that Bolivar held a degree of power tantamount to monarchy.⁶ The reign of this dictator, Irvine believed, had caused disorders that would require years of exertion to repair. Bolivar could boast of having ruined the credit and reputation of his country—he had made enemies, not friends, for Venezuela. "His speeches and proclamations are either directly untrue or so worded as to convey many untruths and deceptions."⁷

Irvine thought it would be no exaggeration to say that most of Bolivar's speeches were intended ". . . to gain him eclat abroad, the population here (in Venezuela) being so debased . . . as to be scarcely worthy of the dexterous acts of deception."⁸ The flourishes of Bolivar must be disregarded—fact must be separated from fancy, the Agent warned. Dissimulation, hardness of assertion, and a spirit of intrigue, characterized his behavior. Irvine went so far as to say that he felt Bolivar would disregard any crime if it favored his designs, provided that impunity and concealment were certain.⁹

Special Agent Irvine was scarcely less complimentary about the General's military leadership. Bolivar had gained power through what Irvine called "false imputation" for only a hand-

⁴Irvine to Adams, Oct. 10, 1818, *ibid.*

⁵Irvine to Adams, July 20, 1818, *ibid.*

⁶Irvine to Adams, Aug. 27, 1818, *ibid.*

⁷Irvine to Adams, Nov. 2, 1818, *ibid.*

⁸Irvine to Adams, Oct. 29, 1818, *ibid.*

⁹Irvine to Adams, Oct. 29, 1818, *ibid.*

Arkansas Academy of Science Proceedings

ful of exiled patriots had made Bolivar their military chief. "The burning ambition of the Chief Bolivar, . . . led him to proscribe every officer whose talents or success provoked his envious hate."¹⁰

Not only was Irvine unimpressed with Bolivar's past military record, but with his present one. It has been proved, Irvine wrote, that Bolivar was "unteachable." Irvine estimated that more than twelve thousand men had been furnished Bolivar—enough to have defeated the Spanish with average generalship.¹¹ As Irvine gathered more and more information, his dislike of General Bolivar became more intense.

Without an element of military instruction, he effects the language of Napoleon; without a ray of true political knowledge, or a hint of morality, he apes the style and (it is said) claims the character of a Washington.¹²

During the period of Baptis Irvine's mission to Venezuela the most spectacular event occurred in February 1819. It was during this month that a constitution was adopted, and the established government of Venezuela became actual rather than provisional. General Bolivar in a public pronouncement had renounced his "dictatorial" powers and had called for the establishment of a permanent Venezuelan congress. Irvine had optimistically reported that administrative changes were taking place in the government. "Any change would be an improvement," he wrote. In spite of Bolivar's presence, the new constitution and laws might save Venezuela which had been ". . . more scourged and endangered by a Don Quixote—with military ambitions but unmilitary talents—than by the cruelty of a relentless and savage enemy."¹³ Bolivar's dictatorship must have an end, for the wheels of his government were clogged with imbecility,¹⁴ the Agent wrote.

Finally in one fell swoop Irvine unleashed a broadside attack on the motives, methods, and goals of General Bolivar. Bolivar's proclamation of a Constitution had been calculated to answer the purposes of its author. Irvine believed the proclamation was solely a pretense of humility, for Bolivar wished to perpetuate his power. "By . . . preferring to restore the sov-

¹⁰Irvine to Adams, Sept. 14, 1818, *ibid.*

¹¹Irvine to Adams, Oct. 1, 1818, *ibid.*

¹²Irvine to Adams, Oct. 29, 1818, *ibid.*

¹³Irvine to Adams, Oct. 1, 1818, *ibid.*

¹⁴Irvine to Adams, Oct. 6, 1818, *ibid.*

Observations on Simon Bolivar

ereign power to the people, he insinuates that his dictatorial authority was conferred upon him by the people; which is not the fact."¹⁵ Only a small group of citizens in Caracas had conferred that authority and even at that time Bolivar was in disgrace and out of the country on one of his many flights—for he had almost more flights than "Mohamet." "From that moment to this a harlequin has played the chief part. He now expects, it is said, to increase his power by a congress of ignoramuses; and certain it is he is planning everything for them in advance."¹⁶

Undoubtedly Irvine looked for every shred of information to support his prejudice. He even went so far in one report to state that there were many who would rather see Venezuela remain under the Yoke of Spain for years to come than to see it liberated in the manner and ideals of General Bolivar.¹⁷ The emphasis which Irvine gave to the character of Bolivar was quite clear.

During the meeting of the Congress Irvine did mellow a bit after Bolivar had announced his retirement into private life and avowed his determination to accept no official honors or public spoils.

The act of renunciation on the part of Bolivar, serves to veil the vices and errors of his previous career. His failings and virtues variously represented now, we shall leave to the historians of this revolution to depict. There are many persons here who do not hesitate to assign necessity, arising from incapacity and disappointment, as the sole cause of his resignation. To adopt this explanation of motive were to divest his previous conduct of all title to respect or admiration. It is more liberal, just and charitable to attribute good acts to good motives . . . The account of services and abuses he must settle with his fellow citizens. . . ."¹⁸

Shortly after the adoption of the new Constitution Special Agent Irvine sailed for home, depressed at prospects for republican institutions in Venezuela. To the State Department Irvine recommended the maintenance of cautious neutrality

¹⁵Irvine to Adams, Oct. 29, 1818, *ibid.*

¹⁶Irvine to Adams, Oct. 29, 1818, *ibid.*

¹⁷Irvine to Adams, Oct. 29, 1818, *ibid.*

¹⁸Irvine to Adams, Feb. 16, 1819, *ibid.*

toward Bolivar's government in Venezuela. He wrote books, pamphlets, and newspaper articles championing republicanism and democracy for the Latin American governments. At the same time he pointed out the specter of monarchy or temporary dictatorship as manifested in Simon Bolivar and Venezuela, 1818-1819. Irvine's colorful and literary reports are a primary source for events in Venezuela for this period.

TOWARD A MORE REALISTIC EVALUATION OF THE UNITED NATIONS

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Four months removed from India's conquest of the Portuguese enclaves, it is now possible to realistically—and perhaps objectively—evaluate the impact of this event on the United Nations. The doomsday prophecies have not been fulfilled, viz., war over Dutch West New Guinea, British Honduras, and Guantanamo has not occurred. Now that the death knells for the United Nations rung so frequently in December have subsided the international politician should embark on a sober evaluation of the role of international organization in American foreign policy.

Two Developments

The Goan invasion of December 16, 1961, sculptured in relief two developments which necessitate a more realistic evaluation of the United Nations.

(1) Multiplication of membership.

The first of these developments is the oft-referred-to multiplication of United Nations membership, which may be divided into three stages.

The earliest period spanned the beginning five years of United Nations' existence, during which the United States employed the U.N. as an effective instrument of foreign policy. The United States, with the approval of its N.A.T.O. allies, with an almost unanimous support from Latin American countries, and a smattering of votes from the Afro-Asian nations, controlled the majority on substantive measures brought before the General Assembly.¹ As the Cold War began and worsened after the founding of the United Nations, the United States relied on the U.N. for a host of international problems ranging from Russian troops in Iran to Communist aggression in Korea.² During this period, the American and Soviet delegates experienced difficulty agreeing on new members for the United Nations; therefore, only eight nations were added.³

¹Of the original 51 members of the United Nations, 14 were European, 22 Western Hemisphere, and 15 Afro-Asian nations.

²In the case of Korea, the United Nations legitimized a policy of intervention, which the United States would have followed anyway.

³Two European (Iceland and Sweden) and six Afro-Asian (Afghanistan, Thailand, Pakistan, Yemen, Burma, and Israel) nations were the eight.

The second period of U.N. history is a transition stage. Chronologically, it began with the Korean War and was characterized by a noticeable lack of induction of new members, and by further increase in the power of the General Assembly through the "Uniting for Peace" resolution.⁴ The authority of the Security Council continued to wane vis-a-vis the General Assembly.

The birth of the third period of United Nations history is precisely dated—December 14, 1955—when East-West approval of sixteen new members broke the membership dikes. This trend has continued down to the present day until the geographical distribution of the United Nations' 104 members shows 26 European, 22 Western Hemisphere, and 56 Afro-Asian nations. Under these conditions, the statement of a Portuguese diplomat aptly describes the American position:

I am afraid your delegation in the United Nations no longer organizes and creates majorities. It seems reduced now to merely joining them.⁵

While these words were spoken out of Portugal's bitterness over the United States' lack of diplomatic action in the Goan invasion, they have been increasingly true since 1955. The U. S. successfully organized and created majorities only when the Communist empire blundered (e.g., Russian suppression of Hungary and Chinese conquest of Tibet) and on a subject clearly defined as a matter of national security (admission of Communist China). On other occasions, such as the General Assembly resolution on Angola, the smaller nations flexed their voting muscles.⁶ In regard to Goa, formidable opposition by minor powers to action against India's aggression discouraged a United States' plan to transfer the dispute from the Security Council to the General Assembly after the Soviet veto.

⁴The nation that joined the U.N. during this period was Indonesia on September 28, 1950. For a description of the "Uniting for Peace" resolution, see *Everyman's United Nations*, 6th ed., (New York: United Nations Office of Public Information, 1959), pp. 75-77.

⁵*New York Times*, December 19, 1961, p. 19.

⁶The General Assembly resolution on Angola was adopted January 30, 1962, by a vote of 90 in favor, 2 opposed (Spain and the Union of South Africa) and one abstention (France). Portugal boycotted the debate. This resolution urged Portugal "to undertake, without further delay, extensive political, economic and social reforms and measures and in particular to set up freely elected and representative political institutions with a view to transfer power to the people of Angola." This was a stronger resolution than the one approved by the Security Council six months earlier, June 9, 1961.

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(2) Disputes between minor powers.

The Goan incident also points up a second—and much newer—development in the U.N. evolution: the inability of collective security to solve disputes between minor powers.

Since 1945, enforcement of United Nations decisions has resulted in a dichotomy. On one hand, the U.N. successfully enforced its will in disputes involving small nations while, on the other, it failed in the all-important area of Cold War disagreements between the two superstates—the Union of Soviet Socialist Republics and the United States of America. Is Goa a straw in the wind portending a break-down of enforcement machinery on problems which heretofore have been solved? This is a sobering question for the friends of international organization to honestly answer.

Goa is not a clear-cut case of U.N. failure to solve a minor dispute because the Soviet veto blocked Security Council action and complicated the issue. The U.S.S.R.'s attempt to make political hay in the sunshine of colonialism injected the Goan question into the Cold War, where it is largely out of place. Goa may or may not represent a new trend in United Nations' evolution, a trend which heralds the decline of international organization as an effective instrument for world peace. At a minimum, United Nations' efficiency is impaired and its prestige damaged by India's action.

In a more optimistic vein, Ambassador Stevenson analyzed the Portuguese-Indian dispute recently and recalled that

in December came the alarming military action against Goa, in which armed force was used, in the name of anti-colonialism but contrary to the Charter—yet without any action on the part of the United Nations. I spoke at the time of the very grave consequences for peace if this most ill-considered step should be taken as a precedent by others. Let us hope that it proves no more than an aberration.⁷

⁷Adlai Stevenson, speech delivered February 22, 1962, before the Woman's National Press Club, Washington, D. C. (Mimeographed copy released by the United States Delegation to the United Nations.) This statement is far removed from the pessimism of Mr. Stevenson after the Russian veto on December 18, 1961, which prevented U.N. action on Goa: "I am the only delegate, I think, at this table who was present at the birth of this organization. Tonight we are witnessing the first act in the drama which could end with its death." *New York Times*, December 19, 1961, p. 14.

Consequently, two developments make it imperative that a fresh look be given the United Nations. First, the machinery created by the United States to use in the Cold War is now in the hands of the non-aligned countries. Our post-World War II strategy of increasing the power of the General Assembly created a weapon which the United States can no longer aim when fired. Second, the ability of the U.N. to solve disputes involving minor powers is seriously questioned.

A Possible Alternative

As if anticipating the Goan invasion by several months, Senator J. William Fulbright opened the door for reconsideration of the United Nations' role in American foreign policy.⁸ Senator Fulbright's thesis is, simply, that the United Nations has failed primarily because it was founded on the assumption of unanimity among the major powers following World War II. The "formidable threat of aggressive imperialistic Communism" dictates that the West forge a new unity—a Concert of Free Nations. Mr. Fulbright was not alone in raising these doubts before India's aggression, for Commentator Sulzberger echoed the same theme when he penned the warning:

. . . by giving (the) U.N. more authority and at the same time watching our own authority diminish in (the) U.N. we edge toward an uncomfortable position. A few years hence we may desperately try to extricate ourselves.⁹

While attention should be given to the major contentions of Senator Fulbright, it is also important to note his omissions. For example, he does not believe that the United States should abdicate its responsibilities toward the underdeveloped countries of the world, for he envisions an "inner community" composed of our N.A.T.O. allies and an "outer community" open to any non-Communist nation. He does not advocate United States' withdrawal from the United Nations, nor does he attack international organization as a threat to American sovereignty. And, finally, his Concert of Free Nations cannot be interpreted as a "fortress America" concept in modern dress.

⁸J. W. Fulbright, "For a Concert of Free Nations," *Foreign Affairs*, v. 40 (October, 1961), pp. 1-18. For additional information on Senator Fulbright's views on international affairs, see John H. Burnett, "J. W. Fulbright, Chairman of the Senate Foreign Relations Committee," *Arkansas Historical Quarterly*, v. 20 (Winter, 1961), pp. 318-330.

⁹C. L. Sulzberger, "An Embarrassing Diet of Principles," *New York Times*, October 5, 1961, p. 44.

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As a result, the more ardent disciples of international organization find the Concert of Free Nations palatable. If the United Nations could be de-emphasized as an arena for East-West disputes—a role which has given the U.N. its failures and grounds for criticism—then it would receive the respite necessary for evolving toward a more effective organization. Supporters of the United Nations should guard against overestimating the U.N. as the sole elixir for the deep-seated differences that divide the U.S. and the U.S.S.R. Overestimating United Nations' capabilities will lead to overloading, and as Assistant Secretary of State Cleveland pointed out, "overloading can be dangerous."¹⁰

The Domestic Setting

Unfortunately, the re-evaluation of United Nations' usefulness to the United States in the Cold War must take place at an inopportune time, from a domestic point-of-view, because of the resurgence of ultraconservative sentiment. Currently an assortment of criticisms which run the gauntlet from concern over loss of sovereignty to the contention that the charter was inspired by the Soviet constitution are hurled at the United Nations.¹¹ However, as David Riesman has observed, domestic distrust of the U.N. is not "merely isolationist jealousy of our sovereignty; rather, it is based on the belief that any mediator tends to persuade the reasonable fellow to give in to the truculent one."¹²

While the Kennedy administration restudies U. S. policy toward the United Nations, it is buffeted by groups opposed

¹⁰"Up to a point, loading more onto the United Nations helps to enhance its capacity to act. Beyond that point, overloading can be dangerous if it makes the machinery creak too badly or exposes the executive to too many different kinds of political attack at one time." Harlan Cleveland, "The Road Around Stalemate," *Foreign Affairs*, v. 40 (October, 1961), p. 36. Mr. Cleveland amplified the ideas contained in this article in a recent speech. See *New York Times*, February 1, 1962, p. 6.

¹¹"A part of that (Communist) plan, of course, is to induce the gradual surrender of American sovereignty, piece by piece and step by step, to various international organizations—of which the United Nations is the outstanding but far from the only example—while the Communists are simultaneously and equally gradually getting complete working control of such organizations. . . . Until one day we shall gradually realize that we are already just a part of a world-wide government ruled by the Kremlin, with the police-state features of that government rapidly closing in on ourselves." *The Blue Book of the John Birch Society*, 8th printing, (1961), pp. 29-30. For additional comments on the United Nations see W. Cleon Skousen, *The Naked Communist*, (Salt Lake City, Utah: Ensign Publishing Co., 1962), pp. 265-269.

¹²David Riesman, "Dealing with the Russians over Berlin." *The American Scholar*, v. 31 (Winter, 1961-62), pp. 61-62.

to international organization altogether. The danger is two-fold: that, first, President Kennedy will react to extremist views and support an organization which no longer constitutes a reliable instrument of American foreign policy, or second, the administration will be tempted to offer the United Nations as a sacrificial lamb, ignoring its effectiveness on non-Cold War issues. Thus far, President Kennedy has been unwavering in his support. "In my opinion," he said in a January press conference, "the United Nations justifies the effort we put into it substantially."¹³ Later he stated that, "I support the United Nations very strongly and I think the American people do...."¹⁴

While the American people support the United Nations, various developments during the past year serve to dampen their enthusiasm. The American man-in-the-street is, by and large, a prudent breed and views with suspicion the financial troubles at Lake Success. In addition, the chaotic tug-of-war in the Congo and the misunderstood policy of both the United Nations and the United States are not helping matters. The denial of membership to Communist China represents the only tangible victory for "our side" which Americans can cheer.

Despite the trend toward a realistic evaluation of the United Nations, a thread of idealism remains woven into current thinking to remind the international politician of the ultimate port-of-call of international organization. This segment of the political spectrum holds the opinion that the United Nations is the "only true alternative to war," to borrow the phraseology of President Kennedy.¹⁵ Walter Lippman chastizes those who

like spoiled children wish to stop playing if they cannot always win the game. But the grown-up view of the United Nations is, I submit, that if the 50 new members do not agree with us inside the U.N., in all probability they would disagree with us even more violently outside the U.N. Those new nations would still exist if there were no United Nations that they could belong to.¹⁶

¹³New York Times, January 16, 1962, p. 14.

¹⁴Wall Street Journal, March 22, 1962, p. 12.

¹⁵President Kennedy used these words in his speech before the United Nations General Assembly, September 25, 1961, as reported in the New York Times, September 26, 1961, p. 14.

¹⁶Walter Lippmann, "Indispensable Headaches," Lexington Herald, December 27, 1961, p. 3.

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The Question

American policy-makers face the challenge of preventing World War III. Inis Claude points out that the League of Nations was established to prevent another World War I (that is, war by accident), but was incapable of stopping World War II. Furthermore, the United Nations was conceived as a remedy for future World War II's (that is, war by design). Dr. Claude observes that the "United Nations could be interpreted as an attempt to equip the world for dealing with Hitlers—after Hitler was already dead."¹⁷ It is outside the capabilities of international organization mirroring imperfections of the political scene around it to prevent a future atomic holocaust.

A realistic evaluation of the United Nations is not synonymous with scuttling it. In spite of Goa, to use the crude but descriptive statement of Professor Stanley Hoffman, "it is too early to throw in the sponge."¹⁸ Nor does re-evaluation signify that the international politician is jettisoning his idealism. It means rather that we must, with a sigh, set aside the technique of world collective security until conditions are more appropriate. This strategy will, in effect, shield the United Nations from a disastrous fate which it does not deserve, but nevertheless is prescribed by the realities of East-West conflict. The possibility exists that, when the Cold War is ended, we will return to the process of international organization as one of the formulas for eradicating war.

¹⁷Inis L. Claude, Jr., *Swords into Plowshares*, 2nd ed., (New York: Random House, 1959), p. 87. Also see pp. 43-50 for additional comments.

¹⁸Stanley Hoffman, "Popularity and Power at the U.N.," *The New Leader*, v. 45 (February 19, 1962), p. 22.

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