time, the authors, while very briefly alluding to hot-water treatment for the control of leaf nematodes on chrysanthemums in their general discussion of control practices, fail to mention this experimentally tested and published method in their specific discussion of the control of chrysanthemum leaf nematodes.

To the specialist in the field covered by the book, the inaccuracies and omissions may assume an exaggerated importance, yet he will appreciate the difficulties involved in preparing a complete and up-to-date presentation in a field so wanting in critical literature. Despite its shortcomings, the book in its present form is a work for which its authors may be commended.

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RAYS

These Mysterious Rays. By ALAN L. HART, M.D. New York: Harper and Brothers. 1943.

THIS fascinating book describes some of the uses of x-ray, radium and ultra-violet radiation for diagnostic and therapeutic procedures in medicine. It is based upon the author's wide experience in the practice of radiology and his equally wide knowledge of the work of the leaders in this field of medicine.

This book is written for the layman. It describes, by simple theoretical discussions and very often by interesting examples, the apparatus and the technical procedures which the radiologist employs. The clarity of presentation is enhanced by reproductions of photographs of x-ray apparatus and of roentgenograms of several parts of the body.

It appears to the reviewer, an electrical engineer who has had the privilege of working with radiologists, that Dr. Hart has effectively and cogently described radiology for the layman, and that the layman is likely to be a more cooperative and understanding patient if he reads this book.

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REPORTS

A PROGRESS REPORT ON THE CONSTRUCTION OF POPULATION AND PHYSIOGRAPHIC MAPS FOR THE STATE OF MISSOURI[1]

A FEW years ago plans were laid to construct twin wall maps for the State of Missouri; namely, one showing the physiography, the other showing the distribution of population (1940) within the state. The project is one of compiling and of mapping data and analyzing the distribution of population in Missouri in terms of the physiography of the state. This report indicates the work already done, and the steps to be taken in the future in order to complete the project.

POPULATION MAPS

A map, scale of 1:500,000, published by the U. S. Geological Survey, has been used for the work-sheet maps. This map with rather complete drainage, rail and town patterns provides a convenient size suitable for reproduction as a wall map or even for reduction to desk-size maps.

A map of Missouri has been completed showing the variations in sizes of incorporated places according to 1940 Census data. Circles for cities were left open so that dots representing rural population near cities will show through where necessary. Nine categories of incorporated places from "Under 500" to "cities over 100,000" were set up for the classification of incorporated places. A fairly uniform distribution exists throughout the state except in the south central portion where a wider spacing exists and in the St. Louis area where the suburbs form quite a cluster.

Mimeographed forms were set up on which were tabulated total population by minor civil divisions; incorporated populations by minor civil divisions; unincorporated population for each minor civil division; and the area and density per square mile for the unincorporated population for each minor civil division. All population and area data by minor civil divisions were obtained from the Bureau of the Census. Student assistance was possible through NYA and an university research grant.

The terms "incorporated" and "unincorporated" have been used in place of "urban" and "rural" in order to recognize as many settlements as possible in addition to those listed under the census classification of "urban." In addition the plans call for an isopleth inset map of the unincorporated population. This density map will be developed on a basis showing the urban areas by size categories and the density of rural population per square mile by density categories.

PHYSIOGRAPHY MAP

The physiographic map of Missouri on the scale of 1:500,000 has been partially completed. Contours from the many topographic sheets of the state were pantographed on an interval of 100 feet. The coloring of the map, however, has been on the basis of a

[1] No illustrations accompany this considerably condensed article because the maps and tables are not ready for publication or release to the public.

200-foot interval, making it possible to choose the most significant 100-foot contour in any specific area. Approximately a third of the work of this map has been done.

For part of the Ozark area and part of the North Central portion of the state no sheets are available and airplane photographs are to be used to aid in plotting the physiography. Field work may be necessary in order to check some parts of the map. At present the project has been interrupted, but there is no doubt that an accurate physiography wall map of Missouri will be needed as much after the war as now.

SUMMARY

In addition to the two wall maps and the accompanying isopleth map of population distribution the project calls for a detailed analysis of the distribution of the population of the state in terms of the physiography. The two maps on the same scale may be published as twin wall maps in order to portray the geographic distribution of population. In a state with such variety in land forms it is hoped that a close relationship between population distribution and physiography can be brought out with great emphasis. It is hoped that this brief report will record the good intentions of the author to provide new maps useful in the field of geographic teaching and research.

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SPECIAL ARTICLES

A FURTHER INTERFERENCE IN EXPERIMENTAL POLIOMYELITIS

WE have long sought a method of demonstrating and studying the "sparing effect" or "interference phenomenon" in poliomyelitis[1,2] in cheaper animals than the monkey. Mouse experiments have failed to provide a substitute, but an equivalent has been demonstrated in hamsters using strains of virus recovered from the Battle Hill cases.[3]

Young hamsters (40–45 gms) are almost invariably paralyzed within 5 days following the intraperitoneal injection of 0.2 cc of a 10 per cent. suspension of mouse brain collected from animals infected with M-hamster virus. This strain of rodent-paralyzing virus was recovered from a fatal human case by hamster passage.[3] Susceptible animals develop flaccid paralyses of 1 or more extremities between the second and fifth days. Older hamsters are often refractory and can not be used.

If the animals have been injected intracerebrally with certain other rodent paralyzing viruses, they remain free of symptoms. The first experiments were made with McG virus, a weak strain of rodent paralyzing virus isolated in this laboratory. The intracerebral injection of 0.05 cc of a 10 per cent. suspension of mouse brain harvested from animals infected with McG virus rarely paralyzes hamsters but fully protects them against subsequent inoculation with the M-hamster strain. The protection is well developed within 6 days and persists for from 6 to 8 weeks. Armstrong's Lansing strain of mouse poliomyelitis[4] and Jungeblut and Sander's murine SK strain[5] are equally effective. Lymphocytic choriomeningitis also confers protection, as we originally demonstrated in monkeys.[1] Since the other effective viruses may all be related, the action of choriomeningitis and the time relationships are important in showing that the phenomenon is an interference rather than cross immunity.

Suspensions prepared from the brains of young, normal mice afford no protection, but the brains of older mice occasionally have done so. This is believed to imply that latent mouse encephalomyelitis virus is not infrequently present in the brains of old mice.

A suspension of pooled monkey cords, collected 4

EFFECT OF VARIOUS INTRACEREBRAL INJECTIONS ON THE RESISTANCE OF HAMSTERS TO M-HAMSTER VIRUS

Preliminary inoculum	Response	Interval (days)	Number of animals	Response to M-hamster virus	
				None	Paralysis
McG strain	none	1	2		2
" "	"	4	2		2
" "	"	7	2	2	
None			2		2
McG strain	none	6	2	2	
" "	"	26	4	4	
" "	"	34	2	2	
" "	"	47	3	2	1
None			6		6
Lansing (Armstrong)	1 paralyzed	26	4	4	
SK (murine)	All paralyzed	33	3	3	
MV monkey cord	none	21	3	2	1
None			3		3
Feces "Di"	none	7	3	3	
" (heated)	"	7	3		3
Feces "McG"	"	7	3	2	1
" (heated)	"	7	3		3
Feces "Pa"	"	7	3	1	2
" (heated)	"	7	3		3
Feces of newborn	"	7	3		3
None			6	1	5

[1] G. Dalldorf, M. Douglass and H. E. Robinson, SCIENCE, 85: 184, 1937. G. Dalldorf, *Jour. Exp. Med.*, 70: 19, 1939.

[2] C. W. Jungeblut and M. Sanders, *Jour. Exp. Med.*, 76: 127, 1942.

[3] C. W. Jungeblut and G. Dalldorf, *Am. Jour. Pub. Health*, 33: 169, 1943.

[4] C. Armstrong, *Pub. Health Rep.*, 54: 1719, 1939.

[2] Now serving in the Office of the Geographer, Department of State, Washington, D. C.

[5] C. W. Jungeblut and M. Sanders, *Jour. Exp. Med.*, 72: 407, 1940.