them to this office with the necessary accompanying data. These are turned over by me directly to the Award Committees who make the choice. The Nominating Committees themselves have no power of choice, and indeed never in the remotest way indicate preference for one individual over another."

# DISCUSSION

## THE DECREASE IN VASCULARITY OF HUMAN HEARTS AND KIDNEYS BETWEEN THE THIRD AND SIXTH DECADES

FOR comparison with diseased organs the vascular beds of apparently normal hearts and kidneys were studied by perfusion. A striking finding was a decrease in flow per gram per minute in the organs of people aged 45 to 60 as compared with those 18 to 32. This amounted to 22 per cent. in the hearts, 32 per cent. in the kidneys, although there was no decrease in the average weights of the organs. Minimal changes were apparent in the arteries histologically, and the roentgenograms of the injected arterial beds appeared to be normal in the older group. Reports in the literature indicate a decline of 8 per cent. or less in basal metabolic rate, basal cardiac output and in the total number of renal glomeruli between the ages of 25 and 55. Individuals usually gain weight over this part of the life span, and the average weight of the kidneys actually was 5 per cent. greater in the older group, so that the real decrease in either cardiac work or basal metabolism probably was negligible.

Special precautions were used to remove and break up rigor of the vessels, and kerosene was used for the perfusions in order to avoid the edema of the vessel walls which sets in rapidly with saline perfusions. This method yields rates of flow, at 100 mm Hg, seven to nine times higher than those previously reported for the kidney, perfused with saline, although kerosene has twice the viscosity of saline. By correcting for the effects of differences in viscosity, in perfusion of organs, and for the observed mean blood pressures of the patients, one can derive a value for "possible blood flow" from the rate of perfusion. This averages 350 ccm per minute for the hearts of young adults, 2,080 ccm for their kidneys and 1,580 ccm for the kidneys and 280 for the hearts of the older group. A report on the blood flows through kidneys of living men, calculated from diotrast clearance, contains data on 13 men aged 45 to 56 and 14, aged 18 to 32. While the authors[1] make no reference to the effect of age, the average flow for the older group is 1,100 ccm per minute, 26 per cent. less than that of the younger men (1,400 ccm).

The biologist thinks of the vascular bed as almost as plastic and adaptable as the blood volume itself. New capillaries constantly form, and even in old age vessels grow or atrophy as the need for blood varies. The development of collateral about arteries blocked by injury, and the opening up of abundant vascular channels to supply tumors are familiar phenomena, even in the aged. It is therefore surprising to find a decrease in vascularity without a corresponding decrease in bulk of tissue or in basal metabolic need of the tissue. While the significance of these observations is not clear, they suggest the possibility that vascularity depends on the maximum stress to which the tissue is occasionally subjected rather than the basal or average metabolic needs, and that in most people advancing years bring fewer and less lofty peaks in metabolic activity. However, it is possible that the observed decrease in the vascular bed is due to loss of elasticity and to narrowing of vessels for which no compensation has been made. This would mean that by fifty-five the average man in good health has been robbed by age of over one fifth the original vascular bed in two of the vital organs.

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[1] W. Golding, H. Chasis, H. A. Ranges and H. W. Smith, *Jour. Clin. Invest.*, 19: 739, 1940.

## VOLATILITY OF $N^1$-ACYLSULFANILAMIDES WITH STEAM

DURING an investigation of the pharmacology of $N^1$-dodecanoylsulfanilamide, difficulty was encountered in recovering the compound from the feces of dogs, by extraction with various solvents followed by evaporation. It was found that the compound was volatile with steam. Enough could be steam-distilled to permit identification by a determination of the melting point.

A number of compounds of this series were dissolved or suspended in water (0.5–1.0 g in 100–200 cc) and distilled in an all-glass apparatus, the vapors being passed through an Ace filter of porosity D (average pore diameter of 10–35 microns) to prevent entrainment. The compounds were then determined quantitatively in the distillates by the diazotization method of Bratton and Marshall.[1]

Sulfanilamide and its $N^1$-acetyl, butyryl (butanoyl), heptanoyl and octanoyl derivatives were not measurably volatile with steam. The approximate concentrations of other $N^1$-sulfanilamides (in mgm per 100 cc), obtained by slow and rapid distillations, respectively, were: decanoyl (0.0)(0.13), hendecanoyl (1.6)(7.7), dodecanoyl (0.55)(0.39). The distillates of the latter

[1] *Jour. Biol. Chem.*, 128: 537, 1939.

two compounds contained considerable amounts of solid matter which probably rendered the determinations inaccurate. The tetradecanoyl and stearyl compounds also gave turbid distillates, the solubility of the solid matter being too low to permit a quantitative determination by the method used. The $N^4$-dodecanoyl compound showed no turbidity in the distillate and seemed to have little if any volatility with steam.

Thus it appears that $N^1$-acylsulfanilamides with 8 carbon atoms or fewer in the substituent group have little or no volatility with steam, while with 10–18 carbon atoms in the substituent group, the volatility is high enough to cause serious losses when extracts of biological (or other) materials containing small amounts of the drugs are heated in open vessels. Conversely, it is quite possible that small amounts can be recovered completely by steam distillation. This may offer a useful procedure for the determination of the concentrations of such compounds in body fluids, following their administration. No further work is planned in this laboratory, but we suggest that an investigation of the steam volatility of $N^1$- and $N^4$- substituted sulfanilamides may be of importance in connection with the determination of such compounds in biological materials.

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## AVAILABILITY OF CHEMICALS NOT SOLD COMMERCIALLY

THE Chicago Branch of the American Association of Scientific Workers is considering the following project, in which it requests the cooperation of the reader.

The availability of unusual chemical compounds, pure enzyme preparations, etc., which are not obtainable from commercial sources, is often a matter of the greatest practical importance in determining the feasibility of a research project. Unless the research worker happens to know of an individual or laboratory which has such a compound, he may be forced to undertake a long and laborious synthesis or preparation which is merely incidental to the real problem he hopes to attack. At the same time there may be ample quantities of this material in other laboratories, as an incidental by-product of certain work, and for which the originator has little use.

We would like to collect information as to the existence and availability of the above materials throughout the country, and as to the needs of any investigator for specific substances. We have in mind the establishment of a central filing system where contact might be made between any qualified investigator and the individual or laboratory where the above materials might be obtained.

A canvass of local research circles has drawn forth considerable enthusiasm for the project and an almost uniform expression of opinion as to its potential value. However, from our limited contacts we are unable to estimate the extent of interest and cooperation which we might expect from the research workers of the country as a whole, or the magnitude of the practical aspects of this undertaking. We, therefore, solicit answers to the following questionnaire from individual research workers, from heads of research departments and from any other interested individuals or organizations:

(1) Do you favor the proposed effort to establish a central information agency for the above purpose?

(2) Do you now have or do you have from time to time any unusual chemical compounds or pure enzyme preparations which are not available commercially, and which you would be willing to supply either gratis or at cost to qualified research workers? Please list names of these materials if possible.

(3) What unusual chemical compounds or enzyme preparations, which are not available commercially, do you need for your work at the present time or from time to time?

If the response to this letter warrants it, the Chicago Branch of the American Association of Scientific Workers will be glad to publish an analysis of the answers it receives, defining the apparent scope and potential usefulness of this project. It will also be glad to undertake the execution of the project if the latter does not appear to be too great an undertaking for its personnel and financial resources. In the latter case, our organization will attempt to interest some other national scientific organization or foundation in the matter.

Please address your replies to the undersigned. It is suggested that the secretaries or other officers of interested scientific organizations could help a great deal by drawing this letter to the attention of their memberships and urging them to communicate with us.

SAMUEL SOSKIN,
*Chairman, Committee on Rare Chemicals*
MICHAEL REESE HOSPITAL,
CHICAGO, ILL.

## A PROPHECY FULFILLED

ON March 1, 1941, I wrote as follows to Dr. W. S. Adams, director of Mount Wilson Observatory:

Could you send me prints showing the visual and calcium spectroheliograph appearances of the sun? The dates desired are: Aug. 18, 19 and 20, 21, 1929, or 27 days thereafter; also Dec. 4, 5 and 6, 7, 1929, or 27 days thereafter; also March 21, 22 and 23, 24, 1930, or 27 days thereafter; also July 7, 8 and 9, 10, 1930, or 27 days