Letters

Acupuncture

The recent announcement (News and Comment, 18 Aug., p. 592) by the National Institutes of Health of a "commitment" to study the use of acupuncture in surgical anesthesia and in the treatment of pain resulting from chronic disease raises important questions.

It is accepted in the medical scientific community that all applications for research funds should be buttressed by documentation of sufficient validity to support more than the mere plausibility of the hypotheses proposed to be tested. It is also accepted that the most searching on-site evaluation should be undertaken of the capability and past performance of the principal investigators in the fields of study involved.

Acupuncture in the treatment of chronic disease is an ancient system of medicine, predicated theoretically upon a nonheuristic world view (an admixture of Yin and Yang) and practically based upon a system of diagnosis (the subjective sensation imparted to the examiner by the beat of the radial pulse at the wrist) and a therapeutic technique (the insertion of metal needles 1 to 2 millimeters beneath the skin, with or without the passage of minute amounts of electric current). Neither the diagnostic nor the therapeutic technique has any basis. No relation has been established between segments of the radial artery and the various internal organs referred to, nor has physiological or therapeutic data been presented to indicate a special relation between hypothetical acupuncture "points" or "meridians" and the functioning of internal organs. This lack of relation is understandable, as current acupuncture practice in the treatment of chronic pain differs little from that of antiquity, and only recently have the functions of internal organs been accessible for study. There has been no controlled statistical evidence from the Chinese or from the many Western European practitioners of acupuncture that is in any way superior to a placebo in the treatment of chronic pain.

While evidence for acupuncture anesthesia appears on the surface to be striking, it is, thus far, purely anecdotal, and is generally reportage to the West from guests of the Chinese People's Republic who do not speak Chinese and who are visiting China for other purposes. In one report (*1*), a medical observer specifically interested in acupuncture describes the treatment of six patients by this technique. Three patients received intravenous narcotic analgesics during the procedure, one received subcutaneous narcotic analgesic medication prior to the procedure, and one received a sedating dose of a barbiturate prior to the procedure and subcutaneous scopolamine and intraperitoneal local anesthesia during the procedure. Only one patient was described as receiving no narcotic or analgesic medication, and that patient underwent neurological surgery (anesthesia is not generally used for incision into brain structures or for resection of tumor masses in the brain).

It would appear legitimate, at this time, to arrange for the travel to China of an experienced, Chinese-speaking anesthesiologist, but it seems premature to convene "workshops" to discuss such matters. It is difficult to understand how the awarding of funds for the study of a mode of therapy for chronic pain can be envisaged, when neither evidence for its efficacy nor a plausible hypothesis for its action can be advanced.

It would be tragic if the announcement of such a premature "commitment" to the funding of research in acupuncture were to be interpreted by the public as an endorsement of the technique. While placebo effects have their place in therapy, the absence of adequate diagnosis before treatment may lead to needless suffering, and in some cases to avoidable death.

If criteria other than those long established for the acceptance of research proposals in the medical sciences are used to convene a "workshop," and may be used to evaluate future proposals, perhaps these new criteria and the decisions leading to them, and not acupuncture, require further study.

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Reference

1. E. G. Dimond, *J. Amer. Med. Ass.* **218**, 1558 (1971).

Brazil

The important facets of change in Brazil, as reported in Abelson's editorial "Changes in Latin America" (9 June, p. 1077), are accurate, but the emphases on such physical features as São Paulo's food distribution center and the architecture of Brasilia seem somewhat unfortunate.

São Paulo is one of the fastest growing cities of the world. It also has a current pollution level that makes one long for what by comparison is the relatively pure air of New York or Los Angeles. The traffic congestion during the morning and evening rush hours throughout São Paulo compares unfavorably with that on the Long Island Expressway.

That there is no freedom of the press in Brazil is clearly indicated by a comparison of items concerning Brazil in the Washington *Post* or the *New York Times* with those in the leading papers of Rio de Janeiro or São Paulo on the same day. Newspaper reports concerning the government's harassment of hundreds of Brazilian university professors 2 or 3 years ago provide a case in point.

The number of Brazilian students receiving higher education has increased dramatically; but the much needed reform of universities has been effectively stifled. The model for major reform planned for the new university of Brasilia was abandoned. As a result the university is an anachronism—in one of the world's most modern settings it mirrors the antiquated pattern of Brazil's older universities. Many of Brazil's most eminent scholars—including some of its outstanding scientists—are in exile. Work on some five or six dormitories at the University of São

Paulo was recently halted when it was recognized that the large concentrations of students in a dormitory are not politically expedient. The buildings reportedly will be converted into classrooms and offices.

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Marine Discoveries

In his report of 23 June (News and Comment, p. 1312), Wade attributes the discovery of the Hudson River's submarine canyon and the discovery of the Gulf of Mexico offshore submarine salt domes to W. Maurice Ewing, who has recently announced his intention to retire as director of the Lamont-Doherty Geological Observatory. Ewing is one of the most prodigious workers in marine geophysics, submarine geology, and oceanography that the world has ever seen. Unfortunately, he did not arrive early enough on the scene to have discovered the submarine Hudson Canyon, and many workers have contributed to the discovery of submarine salt domes in the Gulf of Mexico.

During the years 1842–44, the U.S. Coast and Geodetic Survey (USC&GS) was surveying the approaches to New York (*1*). The results of the survey were reported by Pourtales and commented on by Lindenkohl. Both of these gentlemen were employed by the USC&GS. Lindenkohl said:

> The sea bottom off the entrance to New York lower bay is characterized by features peculiar to that region. These include:
> 1. A well defined submarine valley.
> 2. An area of clay bottom extending about 100 miles seaward.
> 3. A deep ravine at the edge of the continental slope.

J. W. Spencer, in 1905 (*2*), credits J. D. Dana with being the first to recognize the submerged channel as that of the Hudson River,

> formed when the continent stood at a greater altitude above the sea than it does now. . . . But the discovery of the canyon was first announced by Prof. A. Lindenkohl in 1885. . . .

The earliest reference I could find to submarine salt domes in the Gulf of Mexico is the work of Francis P. Shepard (*3*), published in 1937. He had been working just prior to that on board the USC&GS *Hydrographer*, which was under the command of Captain F. S. Borden. Shepard stated that, "Altogether at least 26 submarine domes have been recognized." Shepard goes on to say in his summary:

> All lie either near the outside of the continental shelf or on the upper portion of the continental slope. . . . The salt domes are not only related to the outer portion of the Mississippi submarine trough, but they are found also all along the outer edge of the continental shelf for at least 180 miles west of the Mississippi passes. . . .

In 1947, the U.S. Geological Survey, with the sponsorship of the Office of Naval Research, under the direction of Henry Joesting, conducted a gravity survey in the Gulf of Mexico, during which several salt domes were discovered. The resulting gravity map was placed on open file by the Geological Survey in late 1947 or early 1948.

In 1957, Lankford and Curray (*4*) speculated that Stetson Bank in the Gulf of Mexico was a surface expression of the salt dome. Ewing began to report on his salt dome discoveries in 1962 (*5*). He and others on board the *Vema* discovered Sigsbee Knolls during *Vema* cruise 3 in 1954. During *Vema* cruise 17, in January 1961, they studied 20 structures by seismic reflection, profiling those which were judged by them to be piercement salt domes. Also, in 1962, Ewing (*6*) and others reported that

> Salt domes existed in a narrow zone approximately midway between the scarps (Sigsbee Scarp–Campeche Shelf Scarp). Twenty-one structures . . . strongly resembling and identified as piercement salt domes were discovered.

In 1968, the *Glomar Challenger* drilled into some of the domes of Sigsbee Knolls, of which there are more than 150 known. Ewing participated in this work (*7*). At hole No. 2, he and others reported the following results:

> Below 136 meters of Pleistocene and Pliocene pelagic sediments, a typical cap rock with gypsum, sulfur, limestone, oil, gas and traces of anhydrite was found. The presence of deep salt beds, probably Jurassic in age, is strongly suggested. This hole was abandoned and plugged, since there were rigid instructions to avoid any possibility of an uncontrolled flow of oil.

There are many other references to these salt domes in the Gulf of Mexico. These will suffice to show that many participated in their discovery.

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