Table 1. Correlation coefficients between dehydrogenase activity (DBDTC reduced) and respiration of onions as affected by maleic hydrazide treatment.

	DBDTC reduced as compared with	
	O_2 absorbed	CO_2 evolved
Succinate added	+0.908*	+0.753
No substrate added	+0.929†	+0.938†

* Significant at the 5 percent level.
† Significant at the 1 percent level.

addition of the substrate to preparations made from material treated with high concentrations of maleic hydrazide. Succinic dehydrogenase appears to be markedly inhibited in material treated with high concentrations of maleic hydrazide. Examination of the data indicated a positive correlation between respiratory activity as measured by DBDTC reduction and by oxygen absorption. Correlation coefficients are given in Table 1 and suggest that the same phenomena are being measured by both methods.

Growth inhibition from applications of moderate concentrations of maleic hydrazide usually takes place for a limited time, the duration being dependent on the concentration of the applied material (*4*). The ability of the treated plant to recover its normal growth after an initial inhibition suggests that maleic hydrazide is converted to noninhibitory compounds. At high concentrations of the hydrazide, the conversion may be so slow that concentrations inhibitory to respiration remain after long periods.

References and Notes

1. F. M. R. Isenberg *et al.*, *Science* **113**, 58 (1951).
2. Authorized for publication as paper No. 1811 in the journal series of the Pennsylvania Agricultural Experiment Station.
3. E. Glock and C. O. Jensen, *J. Biol. Chem.* **201**, 271 (1953).
4. D. L. Schoene and O. L. Hoffman, *Science* **109**, 588 (1949).

4 June 1954.

Communications

Scientists and the McCarran Act

In the 19 June 1954 issue of the *Saturday Evening Post* there appeared an editorial under the title, "McCarran Act will bar no genuine visiting scientists." The editor referred to a recent lecture at Philadelphia, in which I described the difficulties that the U.S. national committees of various scientific unions face when they consider invitations to their unions for meetings in this country. The article implies that I am one of those who "are moving heaven and earth to undermine our immigration policy," and that the purpose of my lecture was "to scrap the McCarran Act," a purpose that is also shared by the World Council of Churches. The editor continues by asserting that under the present interpretation of the immigration act no genuine visiting scientist will be barred unless "he turns out to be a really bad egg."

On 28 June I wrote to the editor of the *Post*, but, after having at first offered to print my letter, Frederic Nelson, associate editor, has now informed me that "the editor who runs our correspondence column feels that we have printed all the letters he thinks we should on the McCarran Act editorial," and that while he himself is sorry about this decision he doubts "that many readers would have reached the conclusion that you should be associated with those who are attempting to change the national policy on immigration." My letter of 28 June was as follows:

> I must take exception to some statements made in your editorial of 19 June concerning the McCarran Act and its effect upon the admission "to our shores" of foreign scientists—those who are not "really bad eggs." You are wrong in associating me with "groups who are moving heaven and earth to undermine our immigration policy." As an astronomer, I know full well that the laws of Newton and Kepler will forever prevent me or anyone else from moving either the earth or the heavens. The heavenly bodies are one of my main interests in life, but my "heavenly" interests do not extend as far as the World Council of Churches, and I do not carry the ball for them.
>
> But regarding our man-made laws, there is one aspect about which I am concerned. Do you *really* think, Mr. Editor, that there is nothing wrong with our present visa policy as it affects the scientists? I do not advocate, and I have never done so, that we "scrap the McCarran Act."
>
> I am a Russian-born naturalized citizen of the United States to whom America has been good, and all my actions since I came "to these shores" in 1921 and all my public statements have been intended to help in the protection of the freedom and the greatness of our country. I warned against the dangers of Russian communism when it was quite unpopular for anyone to do so. And I am not likely to forget the wounds—physical and spiritual—that I suffered as a young officer in the desperate struggle against the Reds when they seized power in Russia. But, as a scientist, it is also my duty to bring to the attention of the people that, for our own protection, (i) we need the knowledge of foreign scientists, and (ii) we must seek and keep their friendship. Do you remember the words of President Truman on 8 Aug. 1945, when he announced the dropping of the first atom bomb over Hiroshima: "Sixteen hours ago an American airplane dropped one bomb on Hiroshima. . . . It is an atomic bomb. It is a harnessing of the basic power of the universe. The force from which the sun draws its powers has been loosed against those who brought war to the Far East." The sun was our clue to the solution of the problem of atomic energy, and all our great physicists—Bethe, Teller, and Oppenheimer too—knew that atomic power on a tremendous scale was possible, because astronomers had told them

that this very power was what made the sun and the stars shine. How did the astronomers know this? About equally, I should say, from the work of the American astronomers, under the banner of our own great Henry Norris Russell of Princeton University, and from that of western European scientists, under the unchallenged leadership of the late Arthur Stanley Eddington of Cambridge University, England. Eddington is dead, but his former close associate, the brilliant Nobel prize winner in physics, P. A. M. Dirac, was recently refused entry into the United States. I do not believe that even under your interpretation he could be described as a "really bad egg." His knowledge, and that of others like him, is tremendously important to us. In any case, we should not be too reluctant to add a small dose of that kind of egg to our domestic diet.

I have been given the honor, and at the same time the responsibility, of serving as the president of the International Astronomical Union, an organization of scientists representing 35 different countries of the world. It was founded in 1919, largely through the efforts of the late George Ellery Hale, the man who built for America the 40-in. refracting telescope of the Yerkes Observatory and the 100-in. reflector at Mount Wilson, and who began the construction of the giant 200-in. telescope on Palomar Mountain. We are very anxious that our Union hold one of its next meetings in this country. But, rightly or wrongly, many foreign astronomers, some of whom have previously been refused entry into the United States, are afraid to apply. The refusal of a visa labels them as "red" or "pink" in their own countries.

This is not a partisan matter, and I should regret it if emotional issues, either for or against my proposal, should arise from it. My proposal is a simple one: that the Attorney General be requested to exercise the power granted to him under the present law to admit, for 2 or 3 weeks, all qualified astronomers to attend a congress to be held under the great domes of Palomar Mountain, Mount Wilson, and Lick Observatories. America is proud of these monuments of achievement by some of its greatest astronomers. The work done with these telescopes is nonsecret, basic research. The opportunity is ours to demonstrate to the world the strength of our science. We need your help and that of our Government to accomplish this.

OTTO STRUVE

Berkeley Astronomical Department, University of California, Berkeley

2 August 1954.

A Method for Controlling Pain of the Face and Jaws Caused by Tic Douloureux

A new method for controlling the chronic recurring face pain of tic douloureux that we have developed entails the partial or complete destruction of the nerve cells of the Gasserian ganglion by injection of boiling water into this sensitive nerve center from which the pain originates.

The injection is performed in the radiographic room under light pentothal anesthesia with the aid of a Franklin x-ray head stand. By repeated roentgenograms, the foramen ovale at the base of the skull is visualized, and a 3¾-in. spinal needle is inserted through it into the ganglion. The needle puncture is made through the skin of the cheek at a point 3 cm below the malar bone and between the ramus of the mandible and maxilla. At some point between 12 and 17 mm from the foraminal edge, blood tinged cerebrospinal fluid is obtained by jugular compression or syringe aspiration, which indicates that the needle has pierced the arachnoid reflection surrounding the ganglion and sensory root of the fifth cranial nerve and that it has been properly placed. Then 1 ml of boiling distilled water is injected. Under light anesthesia, there can be demonstrated by pinprick an area of diminished sensation on the face corresponding to the well-known anatomic distribution of the ganglion. Additional 1-ml injections of water produce a more profound loss of face sensation. It is possible to stop the pain without producing a major sensory loss by injection of smaller quantities of water.

Any analgesic effect produced is believed to be permanent, which is desirable since tic douloureux is incurable except by a major intracranial operation or destruction of the ganglion by alcohol. It is improbable that damage to the brain or other cranial nerves will result if no more than 1 ml of water is injected at any one time, since the water temperature is immediately lowered to a safe level the instant it is diluted by the intracranial cerebrospinal fluid.

This method has always produced a paralysis of the muscles of mastication, which may be detected on careful examination of the masseter and temporal muscles. It is believed that this is temporary and that the motor branch will regenerate.

The method makes possible the relief from the lifelong pain of tic douloureux without the hazards of a major operation or of alcohol injection, as has been necessary in the past. Since most of those suffering from this disorder are elderly persons in poor physical condition for an operation, the procedure can be used without the risks inherent in the other standard procedures required for permanent relief.

Fourteen cases of tic douloureux have been successfully relieved of their pain by this method, since the first case was so treated on 30 Oct. 1953, without a major complication. One case of cancer of the jaw has been relieved of pain by this procedure.

RUDOLPH JAEGER

Department of Neurosurgery, Jefferson Medical College, Philadelphia, Pennsylvania

18 May 1954.