lation tissue. This tends to vitiate usefulness of cortisone as a fibrolytic agent in diseases such as silicosis, scleroderma, etc. It would be harmful to administer cortisone alone in diseases such as tuberculosis, where the fibrous tissue response must not be inhibited.

Cortisone treatment in mice results in a definitely retarded macrophage response. Whether this is due to the diminution of activity of the individual cell or to the depletion or mobilization of the total number of cells could not be determined in the above experiment. Some evidence of total depletion is indicated in our finding (*1*) that administration of cortisone results in a marked reduction of the total cellular content of the spleen. The retardation of the macrophage response may result in a potentially undesirable situation in certain disease processes, e.g., in tuberculosis. Another factor in the retardation of the removal of carbon particles may be due to the stimulation of antihyaluronidase activity by cortisone. This has been reported by Seifter and associates (*3*).

No effect of cortisone on the early formation of acute inflammatory exudate in response to turpentine was noted. This experiment was limited to the early response and did not control the rate of resolution. This question is at present under study by us.

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Additional Confirmatory Evidence of the Rediscovery of the Old Italian Varnish

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In an investigation to rediscover the "lost art" of making the old Italian varnish used centuries ago by the celebrated violinmakers, Stradivarius, the Amati, and others, it was learned from spectrographic analyses (*3–5*) that a number of elements were frequently present in their varnish. The principal elements in the brown varnish were aluminum, iron, silicon, sodium, calcium, magnesium, lead, and manganese, in the order named. Aluminum, iron, and silicon were present in *all* twelve specimens of brown varnish analyzed. The presence of every element, excepting silicon, has been explained, but the unexpected and constant appearance of silicon was perplexing. Moreover, any valid rediscovery of the so-called secret of Stradivarius must account for all the facts. A satisfactory explanation for the presence of silicon thus became necessary.

In 1946 the writer (*2*) proposed that the old Italian violinmakers used metal rosinates in their varnishes and that they, or the alchemists and apothecaries of their time, could have prepared these resins in the following manner. Ordinary rosin was first dissolved in potassa lye extracted from wood ashes, the principal source of alkali in those bygone days. The metal rosinates were then obtained simply by precipitation with a solution of a metal salt such as alum (aluminum-potassium sulfate) or copperas (ferrous sulfate). Since silica or silicates are always present in wood ashes, it was suspected that these might also be the source of the silicon found in the varnishes. The silicon would thus serve as a telltale element that should shed light on the method and the materials employed in making the old Italian varnish.

Theoretical considerations. The extraction of alkali from wood ashes is almost a forgotten art, so it may be of interest to delve briefly into the process. The soluble alkali in the ashes was extracted by three methods: (*a*) extraction with water, which yielded the alkalis in the form of carbonates; (*b*) subsequent addition of lime to this solution, which yielded a stronger lye, but which required two operations or filtrations; and (*c*) extraction of the wood ashes with water and lime (milk of lime), which yielded the lye solution readily with only one filtration or decantation. It would be necessary to boil the carbonate solution obtained from method (*a*) to dissolve rosin; the stronger lyes (potassium and sodium hydroxides) dissolve rosin in the cold. Thus, method (*c*) is simple and direct and is the most likely and logical method that the ancients might have used to prepare their lye solutions to dissolve rosin.

The alkali hydroxides formed in method (*c*) should also dissolve some of the silica present in the wood ashes, converting the silica into soluble alkali silicate. The silicate would in turn be precipitated when the alkali rosinate solution reacted with the metal salt solutions in the precipitation of the metal rosinates. The chemical reactions are as follows:

$$K_2CO_3 + CaO + H_2O = CaCO_3 + 2KOH$$
$$SiO_2 + 2KOH = K_2SiO_3 + H_2O.$$

Experimental results. Only materials and methods fully justified by recorded writings preceding and contemporary with the period in which the old Italian varnish was in existence (A.D. 1550–1750) were used in this research. Well-burned wood ashes were digested overnight with water to which lime (CaO) had been added, and the mixture was filtered through cloth which yielded a water-white filtrate. Freshly powdered rosin in small amounts was then added to the filtrate in the cold, with occasional shaking until an excess of rosin remained; upon standing a few days, clear, amber-colored solutions were obtained; undissolved pieces of rosin were filtered off and weighed. The results of several extractions are summarized in Table 1.

An alum solution or a solution of alum and copperas was then added to the alkali rosinate solution until an excess of the precipitant was present. The mixture was heated on a water bath, which caused the precipitated metal rosinate to coalesce and expedited filtration through cloth. The resulting air-dried resins were freely soluble in turpentine, and these solutions gave glass-clear films upon drying.

[1] The kindness and cooperation of Alan Goldblatt, director, Chicago Spectro Service Laboratory, Chicago, Ill., in making the spectrographic analyses, are gratefully acknowledged.

TABLE 1

WATER EXTRACTION OF ALKALI IN WOOD ASHES

Extract No.	Wood ashes, g	Water added, ml	Lime added, g	Filtrate obtained, ml	Rosin dissolved, g
6	10.0	100	4.0	73	2.7
11	30.0	300	12.0	240	10.0
12	30.0	300	12.0	230	9.8

Varnishes were prepared from these resins and raw linseed oil, using turpentine as the solvent. The varnishes were perfectly transparent and were identical in properties with similar varnishes previously described (*2*) that satisfied the criteria demanded for a re-creation of the old Italian varnish. A brown varnish was prepared as follows:

Preparation of resin: 65 ml alkali rosinate solution and 31 ml solution containing aluminum and iron sulfates.

Preparation of varnish: 2.0 g Al-Fe rosinate dissolved in 4.0 ml turpentine, to which 2.0 ml raw linseed oil was added.

Goldblatt (*1*) subjected the dried film from this varnish to a spectrographic analysis, and the results are reported in Table 2.

TABLE 2

ANALYSES OF A RE-CREATED ITALIAN VARNISH AND A STRADIVARIUS VARNISH

Element present	Re-created varnish, %	Stradivarius varnish, %
Al	0.1 –1.0	0.08 –0.8
Fe	.05 –0.5	.01 – .1
Si	.05 – .5	.08 – .8
Ca	.01 – .1	.03 – .3
Mg	.005 – .05	.01 – .1
Cu	0.0001–0.001	0.005–0.05

The spectrographic analysis of the Stradivarius varnish, also by Goldblatt, has been previously reported (*5*), and the elements common to both analyses are included in Table 2 for comparison purposes.

The two analyses are significant for several reasons. The cause of the presence of silicon in the old Italian varnish has been explained. A fairly pure grade of lime was used in the extraction of the alkali from the wood ashes; the silicon content in the re-created varnish would have been higher if lime produced from siliceous limestone had been used. The alum and copperas were pure chemicals; these materials as they were produced centuries ago no doubt contained impurities that would introduce other elements into the varnish. The explanation for the presence of silicon supplies information as to the method and the materials that might have been used by the old Italians in the preparation of their varnish.

Only the wet, or precipitation, method has been considered in this preparation of the resin for the brown varnish. Metal rosinates can also be prepared by the dry, or fusion, method. When rosin with or without linseed oil was heated with sienna, ochre, and umber (pigments containing aluminum, iron, and silicon), the resulting resins did not contain sufficient silicon, and the varnishes were usually turbid, even after prolonged standing. This, too, would indicate that the precipitation method was the one used for the preparation of the resins for the brown varnish. The possibility does exist, however, that the colorless varnish and some of the other colored varnishes were prepared by the fusion method (*4*).

The similarity of the analyses of the re-created varnish and the Stradivarius varnish in Table 2 is also noteworthy. A varnish has now been prepared that compares favorably in the composition of a group of its constituents with the varnish used by the celebrated master. The similarity of the re-created varnishes to the old Italian varnish with respect to color, permanence of color, transparency, and other properties has already been reported (*2*).

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Summer Growth of the American Oyster in Florida Waters[1]

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Various investigators (*3, 4, 5*) have found that the American oyster *Ostrea virginica* grows an average of 1 in. per year in water north of, and in, Chesapeake Bay. Usually the growth is greater than 1 in. the first year but declines in subsequent years. This growth takes place only during the summer months, and it has been shown by Loosanoff (*2*) that there is no increment during the winter months.

In the Apalachicola Bay area a study is being made of the growth of *O. virginica* in Florida waters. The object of this investigation is to provide data on the growth of all sizes of oysters at all seasons of the year. Results of studies made during the summer season (May–October, 1949) indicate that growth in Florida waters is considerably more rapid and more extended than that observed in northern waters. No other recorded data on growth rates of Florida oysters have previously been published.

Growth of oysters from time of setting to 6 weeks of age was observed on spat that adhered to shell contained in wire baskets of the type commonly used in the study of oyster spawning (*1*). Studies on growth of oysters 11–16 weeks of age were made on individuals that adhered to cultch. Oysters 16–31 weeks of age were studied by

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