Archaeology

A Tuscan mining village

from Richard Hodges

RECONSTRUCTIONS of mediaeval village life conjure up an image of harsh, feudal conditions for an undernourished peasant community. The remarkable contemporary descriptions of the fourteenth century Pyrenean village of Montaillou suggest badly constructed dwellings, a poor diet and long hard winters (see Ladurie, E.Le R. *Montaillou* Gallimard, Paris, 1975). Therefore, it comes as a surprise to discover that Mediterranean coastal villages of the same date are far from primitive. Excavations at the deserted mediaeval hill-top village of Rougiers near Aix-en-Provence (D'Archimbaud, G.D. *Les Fouilles de Rougiers* CNRS, Paris, 1980), revealing a great array of imported ceramic tablewares, glassware and fine metalwork, convincingly counter the impression given by Ladurie. But is Rougiers an exception? Riccardo Francovich's current large-scale excavations of the mining village of Rocca San Silvestro, near Piombino on the coast of Tuscany, Italy, not only endorse the discoveries at Rougiers but offer us a mediaeval archaeological reconstruction to match the description of Montaillou (Francovich, R. *et al. Arch. Medievale* **12**, 313; 1985).

Rocca San Silvestro lies in a mining zone that has origins in the Etruscan period, but today is suffering from industrial malaise. The first reference to it occurs in a document of 1108, and thereafter it figures commonly in twelfth and thirteenth century Pisan sources. Several cartularies record it as a mining village (40–45 houses supporting 230–260 people) associated with iron and copper. But by the early fifteenth century it had been long abandoned, falling victim to the great fourteenth century economic depression in Tuscany and losing out to villages nearer the sea.

In 1984, clearance of the vegetation concealing much of the hilltop revealed the well-preserved dwellings clustered beneath a small tower (see figure). Excavations in 1985 showed that the buildings are remarkable not just for their preservation, but for the quality of the construction. Most of them were probably built in the twelfth century and were never repaired. This is most unusual: at Rougiers, for example, most of the deserted structures are ostensibly late medieval rebuildings of earlier dwellings. The houses and the church have well-coursed stonework while, together with the cobbled streets, worn door-thresholds and paved floors would not be out of place in present-day villages in the region.

The prospect of documenting early Renaissance mining techniques as well as the mines close to the village constitute an important part of Francovich's project. He found a thirteenth century iron adit mine in a building just outside the walls of the settlement, and located copper smelting in an unoccupied part in the northern part of the settlement. The excavations of these areas will continue, together with the bid to pinpoint the precise sources of the metal ores by spectroscopic techniques. But, as Francovich notes, it should be possible to quantify the output of metals by the village and to simulate its economic history to shed new light on the bare register of its written history.

Rocca San Silvestro is hardly known, but these excavations and the anlaysis of its industries should gain it a place in mediaeval history alongside Montaillou. The discoveries reveal the early investment made in mining copper and iron ores

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— iron for ships' nails, tools and weapons; and copper for the myriad kinds of jewellery that were the fashion in hill villages and in the great seats of the Renaissance such as Florence and Siena. The minerals of this region were important in the rise of the Etruscan civilization and for the city communes of the late Middle Ages. But, like mining villages throughout the history of western Europe, the zenith of Rocca San Silvestro was short lived. □

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Biochemistry

G-protein control of inositol phosphate hydrolysis

from Bob Michell and Chris Kirk

THE many cell-surface receptors that regulate adenylate cyclase do so through two guanine nucleotide-dependent G proteins (or N-proteins), one of them stimulatory (G_s) and the other inhibitory (G_i)[1]. Recent work has revealed that these are two members of a large family of G proteins that are similar in structure and are essential to a variety of signal-transducing reactions at membranes (see the recent discussion in *News and Views*[2]). A second major family of receptors transmits its message into target cells by activating a phosphoinositidase C (PIC) that hydrolyses phosphatidylinositol 4,5-bisphosphate (PtdIns(4,5) P_2) to 1,2-diacylglycerol and inositol 1,4,5-trisphosphate (Ins(1,4,5)P_3). These compounds both act as intracellular messengers (reviewed in refs 3–5). It is now clear that GTP is essential for PIC activation[6–8], but the putative G protein involved in this process has not been identified. A report from Wakelam and co-workers on page 173 of this issue[9] provides the strongest of several recent indications that the GTP-binding p21 proteins encoded by *ras* (proto)oncogenes may be involved in this process.

The preliminary identification of G proteins responsible for receptor–effector coupling in new transmembrane signalling systems frequently uses bacterial toxins that attach ADP-ribose to the α-subunits of particular G proteins and modify their activities. However, attempts to identify a G protein essential to PIC activation by this method have been confusing rather than helpful. In some cells, receptor–PIC coupling is inhibited by pertussis toxin (islet-activating protein), suggesting a role for G_o (a G protein of unassigned function) or G_i (for example, refs 10–12). But pertussis toxin is without effect on PIC activation in other cells, even though it inhibits the action of G_i on adenylate cyclase in these cells (for example, refs 13, 14). Similarly, cholera toxin, which has been used to identify G_s-mediated reactions, has different effects on receptor–PIC coupling in different cells (refs 14,15; unpublished data of G.Guillon *et al.*). Thus it seems clear that none of the well-characterized G proteins can be universally responsible for mediating receptor–PIC coupling. An obvious but experimentally daunting possibility is that different but closely related G proteins may mediate this process in different cells and/or at different receptors.

The idea that the p21 G proteins encoded by the three closely related *ras* proto-oncogenes may mediate recep-